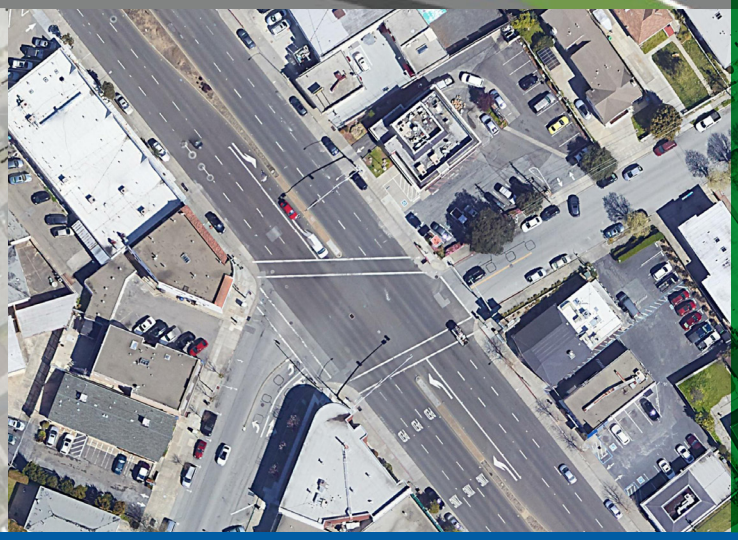
MILLBRAE

GREEN INFRASTRUCTURE PLAN



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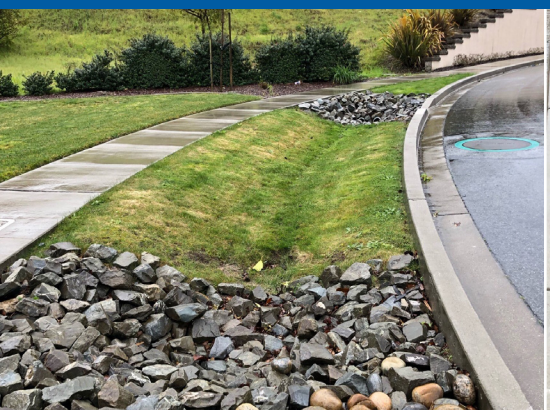
SEPTEMBER 2019



ACKNOWLEDGEMENTS

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PREFACE

Green Infrastructure (GI) is a cost-effective, resilient approach to managing water quality. It uses plants, soils, and other elements to mimic the natural water cycle and capture rainwater. Examples of GI include a variety of stormwater measures, such as stormwater planters or bioretention areas, infiltration systems, permeable pavement, green roofs, green walls, green gutters, and stormwater trees which mimic natural hydrologic processes such as filtration, infiltration, detention, and evapotranspiration.

GI provides multiple community benefits such as improving water quality before discharging it to the bay or ocean by removing pollutants like sediment and trash from stormwater, reducing the effect of urbanization on local creeks and waterways, mitigating the heat island effect, providing climate change resilience, reducing localized flooding, promoting natural ground infiltration and groundwater recharge, increasing biodiversity and habitat for native plants and animals, and enhancing property and neighborhood economic vitality and aesthetics.

The San Francisco Bay Regional Water Quality Control Board (SFRWQCB)'s Municipal Regional Stormwater NPDES Permit (MRP), Order No. R2-2015-0049, regulates pollutants in stormwater runoff from municipal storm drain systems throughout San Mateo, Santa Clara, Alameda, and Contra Costa Counties, as well as the Cities of Fairfield, Suisun, and Vallejo, and the Vallejo Sanitation and Flood Control District. The City of Millbrae is obligated to follow the mandates of the MRP to control stormwater discharge within City limits. The City of Millbrae, as one of the 76 municipalities that are Permittees of the MRP, developed this document, the Green Infrastructure Plan (GI Plan), in order to comply with the MRP's Green Infrastructure Planning and Implementation requirements.

This GI Plan describes how the City will, over time, transition its existing "gray" (i.e., traditional) infrastructure to "green" infrastructure. This local planning document determines, defines, and supports local GI goals and policies. This document also provides guidance to meet stormwater pollutant load reduction goals and creates a process for prioritizing the integration of GI into Capital Improvement Program projects. This plan is intended to be a "living document" and may change and adjust over time as regulatory requirements change, new information is gathered and analyzed, and GI technologies advance.

CEQA EXEMPTION

Development and approval of this Green Infrastructure (GI) Plan will likely result in the construction or installation of GI improvements such as landscaping, irrigation, bioretention areas, stormwater capture devices, and pervious paving, which will improve the quality of stormwater on private property and/or in City rights-of-way and facilities, via operation, repair and maintenance, replacement or reconstruction, and/or construction or conversion of small structures.

Preparation and implementation of this GI Plan qualifies as a California Environmental Quality Act (CEQA) Class 1 categorical exemption (CEQA Guidelines Section 15301) for minor alteration of existing public or private facilities and structures such as highways, streets, sidewalks, gutters, and bicycle and pedestrian trails through addition of GI that would involve no or negligible expansion of existing use.

The policies contained herein also qualify as a Class 2 categorical exemption (CEQA Guidelines Section 15302), as they would involve replacement of existing storm drainage or facilities with GI that would have substantially the same purpose and capacity as the structures replaced.

The policies in this GI Plan further qualify as a Class 3 categorical exemption (CEQA Guidelines Section 1530) to the extent that new GI is incorporated into new construction or in the conversion of, and/or minor modifications to, existing small structures and facilities.

Lastly, the GI Plan qualifies as a Class 8 categorical exemption (CEQA Guidelines Section 15308), as the plan promotes the construction or installation of GI which will “assure the maintenance, restoration, enhancement, or protection of the environment” through improvement to water quality, provision of flood protection, and enhancement of community aesthetics. The City Council will provide final approval for adoption of this GI Plan, and a Notice of Exemption will be filed.

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GREEN INFRASTRUCTURE PLAN APPENDICES

ABBREVIATIONS

BASMAA	Bay Area Stormwater Management Agencies Association
C/CAG	City/County Association of Governments
CEQA	California Environmental Quality Act
CIP	Capital Improvement Program
City	City of Millbrae
CWA	Clean Water Act
FY	Fiscal Year
GI	Green Infrastructure
GI Plan	Green Infrastructure Plan
GI TAC	Green Infrastructure Technical Advisory Committee
GIS	Geographic Information System
LID	Low Impact Development
MRP	Municipal Regional Stormwater NPDES Permit
MS4	Municipal Separate Storm Sewer System
NPDES	National Pollutant Discharge Elimination System
O&M	Operation and Maintenance
PCBs	Polychlorinated Biphenyls
RAA	Reasonable Assurance Analysis
SCVURPPP	Santa Clara Valley Urban Runoff Pollution Prevention Program
SFRWQCB	San Francisco Bay Regional Water Quality Control Board
SMCWPPP	San Mateo County Water Pollution Prevention Program
SRP	San Mateo County Stormwater Resource Plan
SWRCB	State Water Resource Control Board
TMDL	Total Maximum Daily Load
WDR	Waste Discharge Requirements
WLA	Waste Load Allocation

1.0 INTRODUCTION

1.1 What is Green Infrastructure?

1.1.1 Basics of Green Infrastructure

A traditional stormwater management approach collects excess rainwater (called "runoff") through a series of "gray" infrastructure (curbs, gutters, storm drain structures, and piping) and directs it to the receiving waters quickly and without treatment. As land becomes more developed over time, natural landscapes are converted to impervious areas and soils are compacted, reducing the amount of water which infiltrates into the ground and increasing both the amount of runoff and the speed with which it reaches local creeks and other waterbodies.

As the runoff travels over impervious surfaces, it collects pollutants such as heavy metals, oils, grease, trash, sediment, bacteria, nutrients, pesticides, and toxic chemicals from vehicles, construction sites, animals, landscaping activities, and industrial or commercial businesses. Over time, this leads to the pollution of local waterbodies. In the case of the San Francisco Bay, the water quality is degraded to the point of being "impaired", meaning that it cannot meet at least one of its beneficial uses due to insufficient water quality.[1]

In contrast to traditional "gray" infrastructure, Green Infrastructure (GI) is a means of restoring water quality through implementing a range of natural and built approaches to stormwater management that mimic natural systems. GI can reduce the amount of runoff that enters the traditional piped stormwater system below ground, prevent overflows that pollute nearby water bodies, clean stormwater, and allow water to reabsorb back into the ground. GI uses vegetation, soils, filter media, and/or natural processes to create healthier urban environments. At the scale of a city or town, GI refers to the patchwork of natural areas that provide habitat, flood protection, cleaner air, and cleaner water. At the scale of a neighborhood or project site, GI refers to stormwater management systems and features that mimic nature by absorbing and storing stormwater as well as reducing pollutants through filtration, infiltration, detention, and evapotranspiration.

Figures 1 and 2 represent the differences between the hydrologic cycle before and after development, while Figure 3 represents a balanced approach to stormwater management using GI.

[1] The SWRCB has defined the beneficial uses of the San Francisco Bay to be as follows: industrial service supply, industrial process supply, commercial and sport fishing, shellfish harvesting, estuarine habitat, fish migration, preservation of rare and endangered species, fish spawning, wildlife habitat, water contact recreation, noncontact water recreation, and navigation.

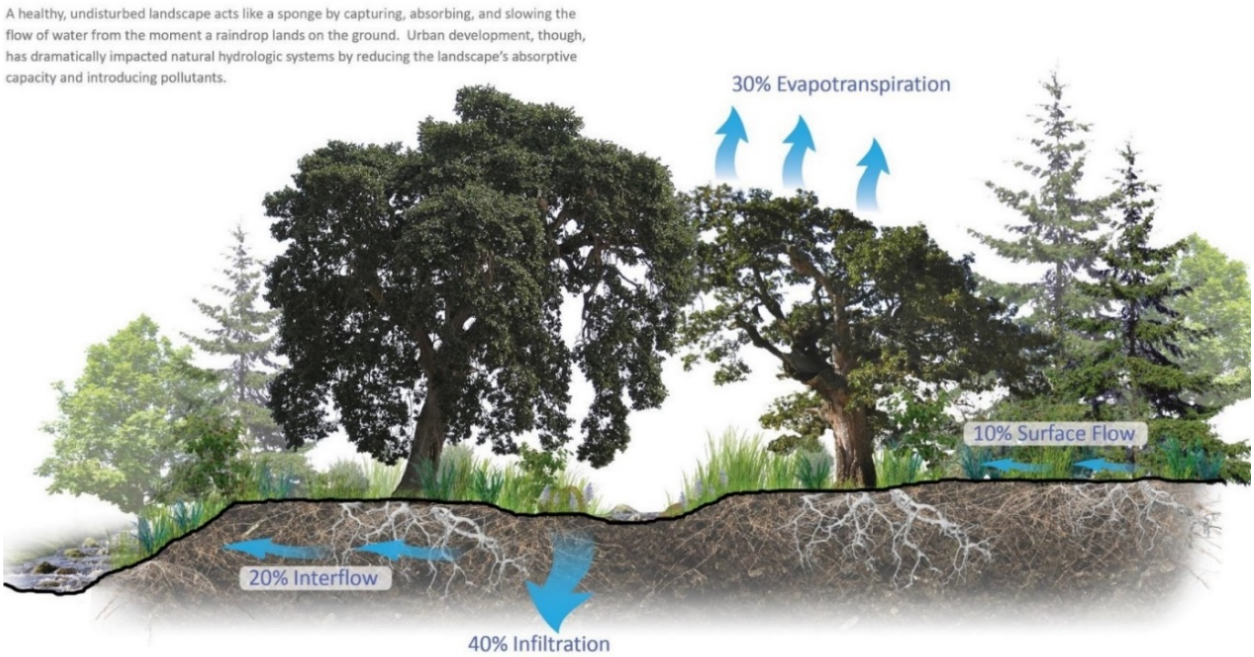


Figure 1. *Pre-Urban Development Water Cycle.*[2]

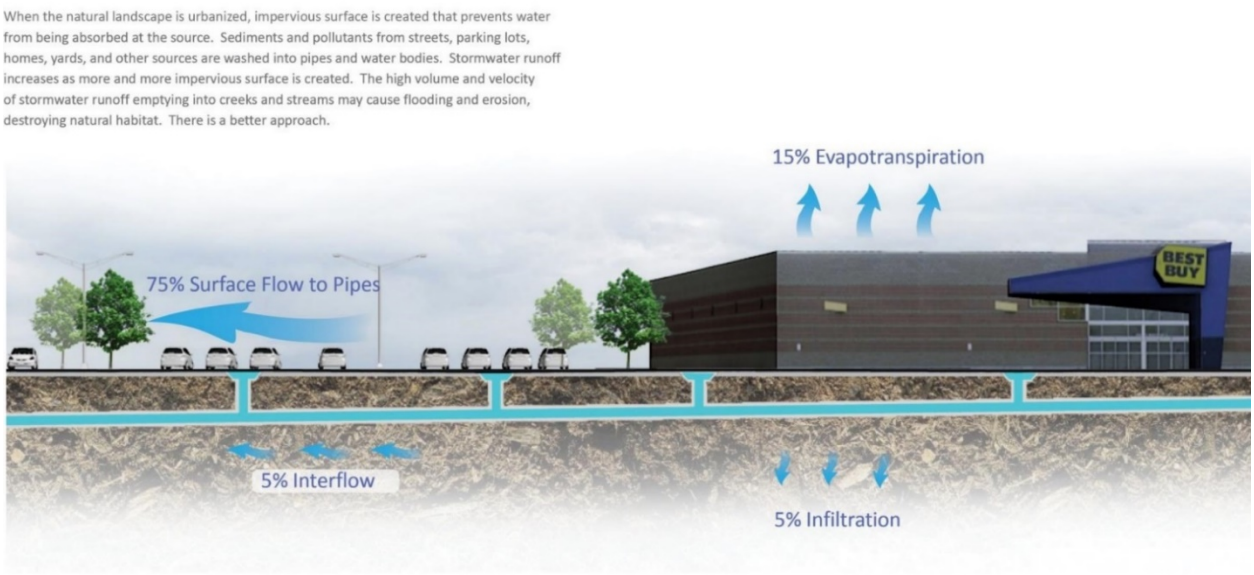


Figure 2. *Post-Urban Development Water Cycle.*[2]

GI measures are used on both public and private lands, such as roads and parking lots, and act as resilient, sustainable systems that retain, detain, filter, harvest, infiltrate, and/or evapotranspire runoff. This limits the discharge of pollutants to the storm drain system and promotes the infiltration of stormwater into the groundwater basin. GI also includes best management practices, like discharging impervious areas to

[2] *San Mateo County Sustainable Green Streets and Parking Lots Guidebook.* (2009). SMCWPPP.

landscape and minimizing of impervious surfaces on new developments, which act to remove pollutants and protect natural systems.

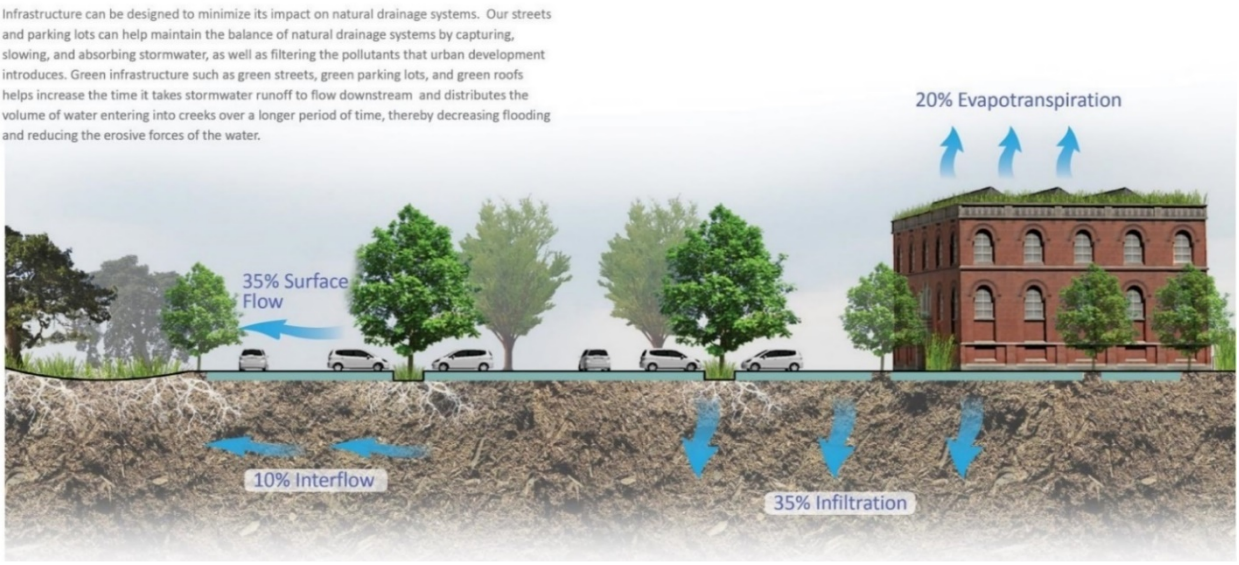


Figure 3. *Balanced Development Water Cycle.*[3]

GI also provides amenities with many benefits beyond water quality improvement and groundwater replenishment, including the reduction of flooding, creation of attractive streetscapes and habitats, and mitigation of the heat island effect.

Examples of GI include landscape-based stormwater "biotreatment" using soil and plants ranging from grasses to trees, pervious paving systems (e.g., interlocking concrete pavers, porous asphalt, and pervious concrete), rainwater harvesting systems (e.g., cisterns and rain barrels), and other methods to capture and treat stormwater. These practices are also known as Low Impact Development (LID) site design and treatment measures.

In addition to LID measures, non-LID measures such as mechanical treatment measures (e.g., media filters or high flow-rate tree well filters) can be used in areas where LID approaches are not feasible. Some mechanical devices, such as hydrodynamic separators, offer pollutant removal capability and may offer partial treatment of the stormwater system. These can be used in isolation or can provide additional pollutant removal capability when installed in a "treatment train" with landscape-based systems.

Table 1 features the various terminology used to describe water quality improvement measures, ranging from engineered GI facilities, such as bioretention areas, to watershed-based practices which reduce pollutants to receiving waters, such as preservation of open space.

[3] *San Mateo County Sustainable Green Streets and Parking Lots Guidebook.* (2009). SMCWPPP.

Table 1. *Water Quality Improvement Measures.*

<table>
<tr><th colspan="2">Green Infrastructure Measures
These measures provide treatment of stormwater or intercept stormwater before it can collect pollutants.</th><th>Mechanical Treatment Measures
These measures can improve water quality through the mechanical removal of pollutants.</th></tr>
<tr><td>GI Planters
Stormwater Planter (also known as a Bioretention or Biofiltration Area, or Bioswale)
Rain Garden
Stormwater Curb Extension

GI Trees
Tree Well
Stormwater Tree
Interceptor Tree

GI Pavements
Pervious Pavement
Pervious Pavers
Porous Asphalt
Porous Concrete</td><td>Underground GI Systems
Infiltration System

GI for Buildings
Rainwater Harvesting
Green Roof
Green Wall

Other GI Vegetative Systems
Green Gutter
Vegetated Swale
Self-Treating Areas
Self-Retaining Areas</td><td>Media Filter (Non-LID)
High-Flow Rate Tree Well Filter (Non-LID)
Hydrodynamic Separator (Partial Treatment Credit)

Natural Systems
Preservation of natural systems can help to support anti-degradation policies on a watershed-based scale.

Open Space Areas
Landscaping

Other Best Management Practices
These practices do not provide stormwater treatment, but they can help to improve water quality.

Street sweeping
Water conservation
Draining impervious surfaces to landscaping
Detention systems</td></tr>
</table>

Information about various types of GI measures is provided in the San Mateo Countywide Water Pollution Prevention Program (SMCWPPP) *Green Infrastructure Design Guide*[4] *(Design Guide)* and *C.3 Regulated Projects Guide.*[5]

The *Design Guide* provides photos and renderings of example GI projects as well as detailed descriptions of various types of stormwater treatment measures. Figure 4 shows the key stormwater treatment measures featured in the *Design Guide.*

[4] The *Design Guide* can be found at SMCWPPP's website at https://www.flowstobay.org/gidesignguide.

[5] *C.3 Regulated Projects Guide* (formerly known as the *C.3 Technical Guidance)* can be found on the SMCWPPP "Flows to Bay" website at https://www.flowstobay.org/newdevelopment.

CHAPTER 2

2.0 Green Infrastructure Measures and Opportunities

Introduction

A Visual Guide of Green Infrastructure Measures

Stormwater Planters

Stormwater Curb Extensions

Rain Gardens

Tree Wells

Infiltration Systems

Pervious Pavement

Green Roofs

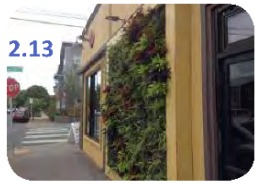
Rainwater Harvesting

Vegetated Swales

Green Gutters

Stormwater Trees

Interceptor Trees



Green Walls

Figure 4. *Visual Guide of Green Infrastructure Measures (SMCWPPP 2019b).*

"Green Streets" are roadway projects which incorporate GI strategies to manage runoff. "Complete Streets" are streets designed with equal consideration to all modes of travel for enhancement of safety and access for cyclists and pedestrians. When combined, Complete Streets and Green Streets are referred to as "Living Streets," "Better Streets," and "Sustainable Streets." This "Living Streets" movement recognizes that environmentally- and holistically-designed streets achieve many benefits, including increased multi-modal travel and safety, cleaner water and air, improved flood and climate change resilience and mitigation, enhanced placemaking and community cohesion, greater energy savings, and habitat retention, in addition to higher property values.

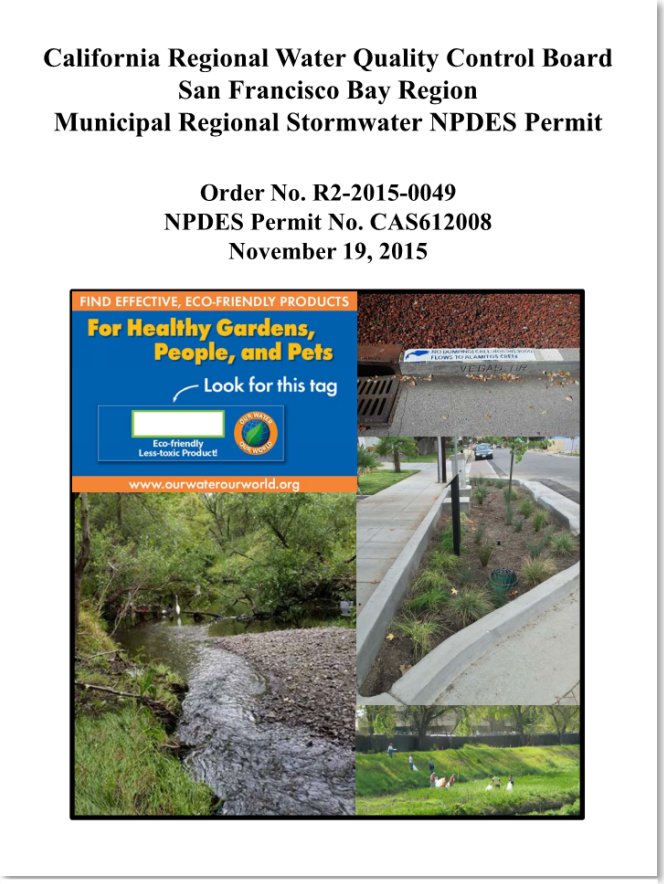
Incorporation of GI include benefits such as increased multi-modal travel and travel safety.

1.1.2 Regulatory Water Quality Requirements

Section 402(p) of the federal Clean Water Act (CWA) requires National Pollutant Discharge Elimination System (NPDES) permits for stormwater discharges from Municipal Separate Storm Sewer Systems (MS4s), which are considered a significant contributor of pollutants to waters of the United States. The US Environmental Protection Agency (USEPA) delegates its authority to regulate MS4s to the State Water Resources Control Board, which, in turn, assigns many regulatory tasks to the Regional Water Quality Control Boards. The San Francisco Bay Regional Water Quality Control Board (SFRWQCB) oversees protection of water quality in the San Francisco Bay Area. In accordance with CWA Section 303(d), the SFRWQCB is required to establish Total Maximum Daily Loads (TMDLs) for certain pollutants that may be causing or threatening to cause or contribute to water quality impairment in the waters of the region.

These pollutants include mercury, polychlorinated biphenyls (PCBs), pesticides, and sediment. There is not yet a TMDL for trash; however, trash is still considered a pollutant.

NPDES Permittees, including the City of Millbrae, are subject to the requirements of the recently reissued Municipal Regional Stormwater NPDES Permit for Phase I municipalities and agencies in the San Francisco Bay Area (Order R2-2015-0049), also known as the Municipal Regional Permit (MRP), which became effective on January 1, 2016. The MRP applies to 76 large, medium, and small municipalities (cities, towns, and counties) and flood control agencies (collectively referred to as Permittees) that discharge stormwater to the San Francisco Bay.



California Regional Water Quality Control Board San Francisco Bay Region Municipal Regional Stormwater NPDES Permit (MRP).

Over the last thirteen (13) years, under successive NPDES stormwater permits, new and redevelopment projects on private and public property which result in the creation or replacement of impervious area exceeding specified size thresholds (referred to as "C.3 Regulated Projects") have been required to mitigate impacts on water quality by incorporating site design, pollutant source control, stormwater treatment, and flow control measures as appropriate. LID treatment measures, such as rainwater harvesting and use, infiltration, and biotreatment, have been required on most C.3 Regulated Projects since December 2011. Construction of new roads is covered by these requirements, but projects related to existing roads and adjoining sidewalks and bike lanes are not C.3 Regulated Projects one or more travel lane(s) is added.

As of 2015, a new section of the MRP requires Permittees to develop and implement long-term GI Plans to address pollutants in stormwater discharges, including polychlorinated biphenyls (PCBs), mercury, trash, and pesticides, to meet Waste Load Allocation (WLA) and TMDL requirements. LID measures incorporated into GI design and retrofit projects can help remove these pollutants from stormwater runoff. For this reason, the MRP establishes a new linkage between public infrastructure retrofits and required reductions in PCBs and mercury. The GI Plan is intended to serve as an implementation guide and reporting tool to provide reasonable assurance that urban runoff Total Maximum Daily Load (TMDL) wasteload allocations are met; the GI Plan also sets goals for reducing, over the long term, adverse water

quality impacts of urbanization and urban runoff to receiving waters. Over the next few decades, Permittees must reduce the loads of PCBs and mercury in stormwater discharges through various means, with a portion of these load reductions achieved through the installation of GI systems.

Other pollutants, including trash and pesticides, should also be coordinated with the GI program since, when properly designed, constructed and maintained, biotreatment systems may also be credited toward trash and pesticide reduction goals.

1.1.3 Contributors to Pollution

Numerous human activities generate or otherwise contribute to pollution in stormwater and can cause impairments to the beneficial uses of receiving waterbodies. The following pollutants of concern have resulted in impairments of waters from San Mateo County watersheds[6]:

- **PCBs.** Sources of PCBs are transformers or capacitors with leaking hydraulic fluids, lubricants, plasticizers, building materials, and pesticide extenders. PCBs are released to the environment through spills, leaks, and improper disposal and storage. PCBs have not been produced since 1977, but they can be transported long distances and bind strongly to sediment and are therefore persistent once in the environment. In addition to treatment by GI, PCBs are managed through the City's PCB Demolition Program, which controls PCB-laden wastes resulting from building demolition, and through referrals of source properties to the SFRWQCB. After referral, the property owner is required to address the pollution.
- **Diazinon and Other Pesticides.** Pesticides have been used throughout the San Francisco Bay Area to manage pests, and are released into the environment during manufacture, formulation, distribution and retail, landscape maintenance, and through agricultural usage (SFRWQCB 2016). Urban runoff transports these pesticides to local water bodies. In addition to treatment by GI, pesticides are reduced through implementation of a Pesticides Toxicity Control Program, which includes an Integrated Pest Management program aimed at reducing the use of pesticides.
- **Mercury.** Mercury sources include historic mines, urban runoff, wastewater discharges, resuspension of mercury-laden sediment in the Bay, and atmospheric deposition (SFRWQCB 2016). In addition to treatment by GI, mercury is reduced through implementation of a Mercury Control Program, which includes source control efforts at local mines.
- **Trash.** Trash accumulates in waterbodies due to littering and dumping of debris which is then transported to water through wind and urban runoff. Plastic represented 60% of the trash accumulated from a 2007 study of six (6) watersheds in the County (SMCWPPP 2007). In addition

[6] *Stormwater Resource Plan for San Mateo County. (2017, February).* San Mateo Countywide Water Pollution Prevention Program. City/County Association of Governments of San Mateo County. Prepared by Paradigm Environmental and Larry Walker Associates, Inc.

to treatment by GI, levels of trash are reduced by various trash prevention and control actions, such as installation and operation of trash capture devices, street sweeping, storm drain inlet cleaning, and hot spot cleanups.

- **Sediment.** Sources of sediment include erosion of creek banks and incision of creek streambeds (often caused by increased stormwater flows resulting from development) as well as excavation and deposition of sediment (such as through construction activities, historic logging, and agriculture). Sediment is controlled via GI and mechanical treatment devices, such as hydrodynamic separators.
- **Indicator Bacteria.** Sources of indicator bacteria along the shoreline of San Francisco Bay and beaches of the Pacific Ocean, and waterbodies of San Mateo County, such as the Marina Lagoon, stem from urbanization as well as natural background sources. Urban stormwater runoff carries pet waste and litter which contributes to coliform bacteria. Other sources include sanitary sewer leaks and overflows, boat waste, litter from recreation, and direct deposit by wildfowl (SFRWQCB 2013).

1.1.4 Benefits of Green Infrastructure

GI is a long-term solution to reduce the amount of water pollution entering nearby creeks, rivers, and the ocean by utilizing natural systems, such as water retention and the absorption capabilities of vegetation and soil, to treat urban runoff. Increased implementation of GI will ultimately lead to improved quality of urban water discharge.

GI is associated with a range of environmental and human health benefits, especially in urban areas. For example, a stormwater curb extension provides both improved water quality and traffic calming. The City will prioritize types and locations of GI measures which provide multiple benefits. Table 2 lists the key benefits of GI.

Table 2. *Green Infrastructure Benefits.*

1.2 Purpose, Goals, and Benefits of the Green Infrastructure Plan

1.2.1 Statement of Purpose and GI Plan Goals

This GI Plan describes how the City will shift its impervious surfaces and storm drain infrastructure from "gray" (traditional) to green. In other words, the plan describes how the City will change processes and practices over time to replace infrastructure which directs runoff directly into storm drains and receiving waters with Green Infrastructure, which slows runoff by dispersing it to vegetated areas, harvests and uses runoff, promotes infiltration and evapotranspiration, and utilizes bioretention and other GI practices to treat stormwater runoff.

The GI Plan also demonstrates the City's long-term commitment to the implementation of GI to help reduce loads of pollutants conveyed in stormwater and discharged into local waterways. The GI Plan establishes milestones for areas of impervious surface to be retrofitted with GI and serves as an implementation guide and reporting tool to provide reasonable assurance that urban runoff TMDL wasteload allocations are met. It sets goals for reducing the adverse water quality impacts of urbanization and urban runoff on receiving waters over the long term.

The GI Plan identifies means and methods to prioritize particular areas and projects within the City's jurisdiction, at appropriate geographic and time scales, for the implementation of GI projects. Furthermore, it will include means and methods to track the area within the City's jurisdiction that is treated by GI controls and the amount of directly connected impervious area (i.e., impervious area which drains directly to the storm drain system without first flowing across permeable land area).

The City will aim to meet the milestones established in the GI Plan by incorporating GI, where feasible, into the Capital Improvement Program (CIP). In addition, the City will strive to collaborate in regional efforts to improve water quality through multi-jurisdictional projects.

The GI Plan goals and objectives are summarized in Table 3.

Table 3. *GI Plan Goals and Objectives.*

GI Plan Goals	Objectives
Protect the Environment	• Improve water quality by using GI to treat stormwater runoff • Protect local creeks and waterways through reduction of sediment and peak runoff • Raise public awareness about pollution prevention
Reduce Urban Flooding	• Reduce peak runoff volumes and velocities using GI
Use Rainwater as a Resource	• Harvest and use runoff for non-potable purposes • Promote neighborhood greening and create habitat using landscape-based GI measures
"No Missed Opportunities"	• Establish procedures and practices to require and implement GI practices in public and private projects as part of the City's regular course of business • Set milestones and goals for water quality improvement • Identify and prioritize areas and projects within the City's jurisdiction for the implementation of GI projects • Incorporate GI, where feasible, in the CIP projects • Coordinate the GI Plan with other local planning documents and promote the multiple benefits of GI • Establish a means of tracking potential and completed GI projects

1.2.2 Integration of GI Plan with Provision C.3

The MRP requires Permittees to use their planning authorities to include appropriate source control, site design, and stormwater treatment measures in new redevelopment projects, with the aim of addressing stormwater runoff pollutant discharges and preventing increases in runoff flows from new and redevelopment projects. Projects which meet the MRP-established thresholds must include stormwater treatment systems and are called "C.3 Regulated Projects".

In the MRP, the SFRWQCB states that the GI Plan's implementation is required, in part, as an alternative to expanding the definition and lowering the threshold of C.3 Regulated Projects prescribed in Provision C.3.b.[7] C.3 Regulated Projects are required to treat their site stormwater with LID site design and

[7] Since 2006, private or public projects that create or replace 10,000 square feet or more of impervious surface have been deemed Regulated Projects under Provision C.3 of the MRP (with certain exceptions; for example, single family homes not constructed as part of a larger project are exempt). Effective December 1, 2011, the threshold was reduced from 10,000 to 5,000 square feet for uncovered parking areas, restaurants, auto service facilities, and retail gasoline outlets. Effective 1/1/16, Under MRP 2.0, all projects including single-family dwellings with ≥ 2,500ft^2 and < 10,000ft^2 of impervious surface must install one or more of six (6) specified LID site design measures.

treatment control measures, thus contributing to the City's overall GI and sustainability goals. Lower thresholds for C.3 Regulated Projects would result in more projects being required to incorporate GI as a condition of new or redevelopment. The SFRWQCB may opt to lower this threshold in a future permit, however, if progress towards GI milestones is deemed insufficient.

The City is committed to protection of its natural resources, and to that effect will continue to provide oversight of implementation of LID on private projects in accordance with Provision C.3 requirements and will continue to incorporate LID and GI into Capital Projects.

The City will plan, analyze, implement, and credit GI systems for pollutant load reductions on a watershed scale. One focus of the GI Plan is the integration of GI systems into Non-Regulated public rights-of-way projects. Another objective of the GI Plan is to provide incentives or opportunities for private property owners to add or contribute GI elements to Non-C.3 Regulated Projects. Additionally, the GI Plan provides a mechanism to establish and implement alternative or in-lieu compliance options for C.3 Regulated Projects as well as to account for and justify Special Projects in accordance with Provision C.3.e.[8]

GI measures such as stormwater curb extensions can provide traffic calming within busy streets.

1.2.3 Benefits of Developing a GI Plan

Currently, most of the infrastructure constructed within the City is classified as "gray" infrastructure. The City is working toward fostering a more sustainable urban community by incorporating GI components in

[8] On November 28, 2011, the SFRWQCB amended the MRP to allow LID treatment reduction credits for smart growth, high density, and transit-oriented development projects which meet certain requirements. Special Projects can use non-LID treatment, such as high flow-rate media filters and high flow-rate tree well filters.

Capital Improvement Projects. This GI Plan can be used to educate City staff, developers, and the general community on both the nature of GI as well as the environmental, economic, and human health benefits of cultivating a climate in which opportunities for incorporation of GI are identified and pursued. Additionally, the GI plan provides guidelines for implementation of GI in future developments. Benefits of this GI Plan include the following:

- Aids the City's and County's mission to create sustainable communities
- Facilitates systematic integration of GI into existing practices
- Identifies priority implementation locations
- Supports the City in meeting current and future permit requirements
- Assists in understanding of compliance costs as well as planning and budgeting for future implementation

1.3 Overview of Green Infrastructure Plan Development Process

1.3.1 Regional and SMCWPPP Guidance and Inter-Agency Collaboration

Since the issuance of MRP 2.0, the City of Millbrae has undertaken a substantial effort to develop the GI Plan. In collaboration with the SMCWPPP Green Infrastructure Technical Advisory Committee (GI TAC), which was formed in April 2016 to address the new permit requirements, the City worked diligently to develop the elements of the GI Plan. Through SMCWPPP, the City participated in and supported regional (BASMAA) efforts, including the preparation of technical projects, memos, and reports.

A timeline showing the development of the key work products developed through the GI TAC is provided in Figure 5. These and other deliverables include the following:

- **GI TAC.** Formation of a committee to aid coordination among the San Mateo County Permittees to develop the GI Plans.
- **SRP.** Development of the San Mateo Countywide Stormwater Resource Plan (SRP), which established a prioritization protocol for GI projects and a list of prioritized GI projects.
- **CIP Screening.** Training on the BASMAA GI Screening process (BASMAA, 2016) to aid cities in undertaking an annual evaluation of their Capital Improvement Program for GI potential.
- **GI Workplan.** GI Workplan materials development, including the template, sample staff report, and sample resolution.
- **Green Suite.** Development of Countywide GI Guidelines and Specifications, consisting of the *GI Design Guide* and *C.3 Regulated Projects Guide,* referred to as the "Green Suite".

- **GI Funding Analysis.** Evaluation of GI Funding Options, which was summarized in a Nexus Evaluation report developed by SCI Consulting Group on behalf of SMCWPPP, and with input from the GI TAC.
- **RAA.** Completion of a Reasonable Assurance Analysis (RAA), which sets milestones countywide for the amount of stormwater treatment capacity, impervious surface, and sediment reduction provided by each Permittee in 2020, 2030, and 2040.
- **Planning Updates.** Model Planning Document Language, which was a review of various planning documents completed by CD+A on behalf of SMCWPPP and with input from the GI TAC.
- **Alternative Sizing Criteria.** BASMAA Guidance for Sizing GI Facilities in Street Projects & GI Facility Sizing for Non-Regulated Street Projects. This serves to address Provision C.3.j.i.(2)(g) of the MRP, which states, "Permittees may collectively propose a single approach with their Green Infrastructure Plans for how to proceed should project constraints preclude full meeting the C.3.d. sizing requirements."

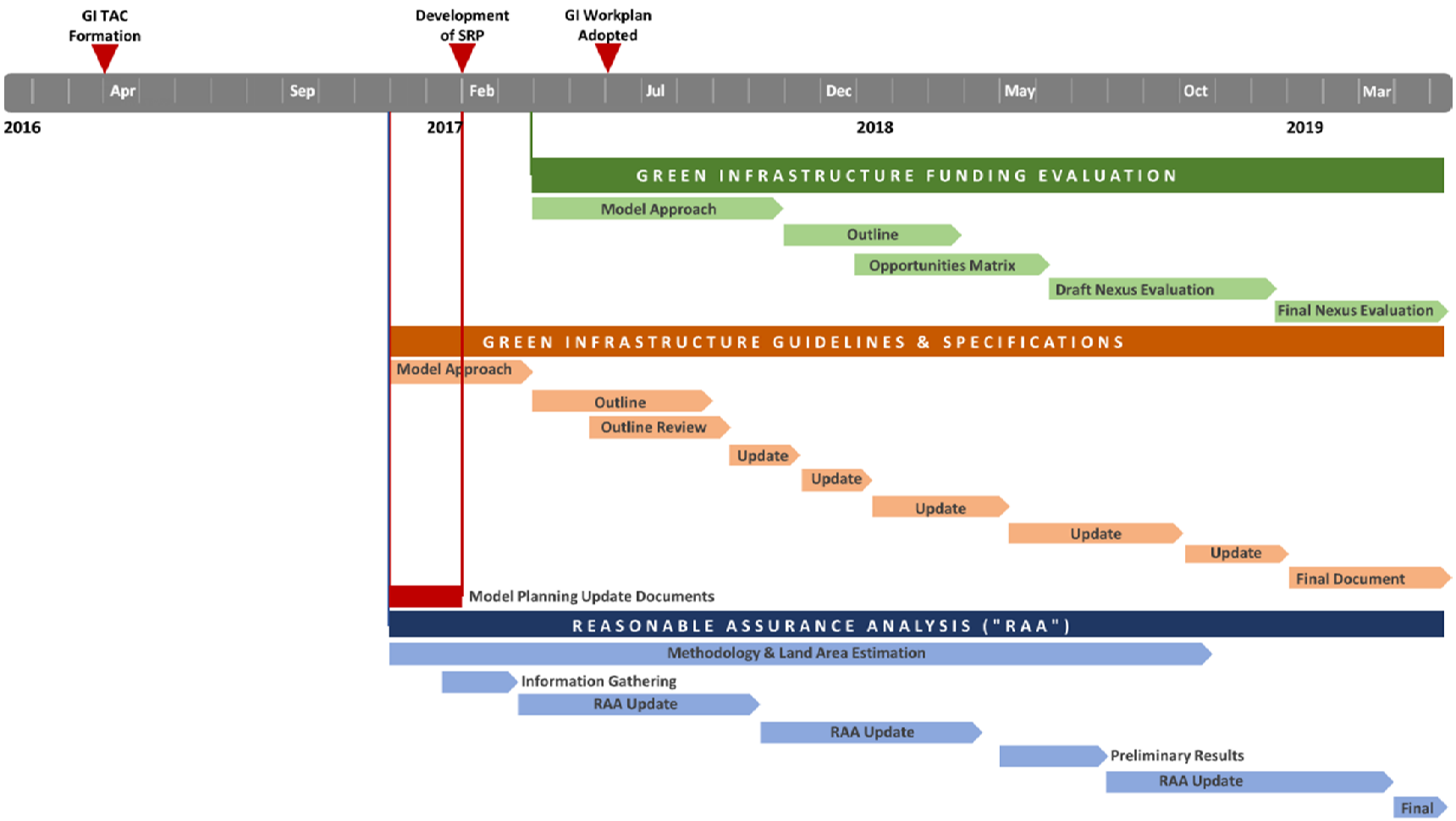


Figure 5. *SMCWPPP Green Infrastructure Technical Advisory Committee Deliverables Timeline.*

These deliverables make up the key elements and backbone of the GI Plan. Developing these elements at a Countywide level was a significant effort, and required collaboration among the various agencies in San Mateo, all of which have a different local context and perspective. Each GI TAC meeting required a commitment on the part of member agency staff to (1) review discussion items several weeks prior to the meeting, (2) attend meetings a minimum of 2.5 hours in length either remotely or in person, and (3) provide feedback on in-progress or updated versions of deliverables within a few weeks of each meeting.

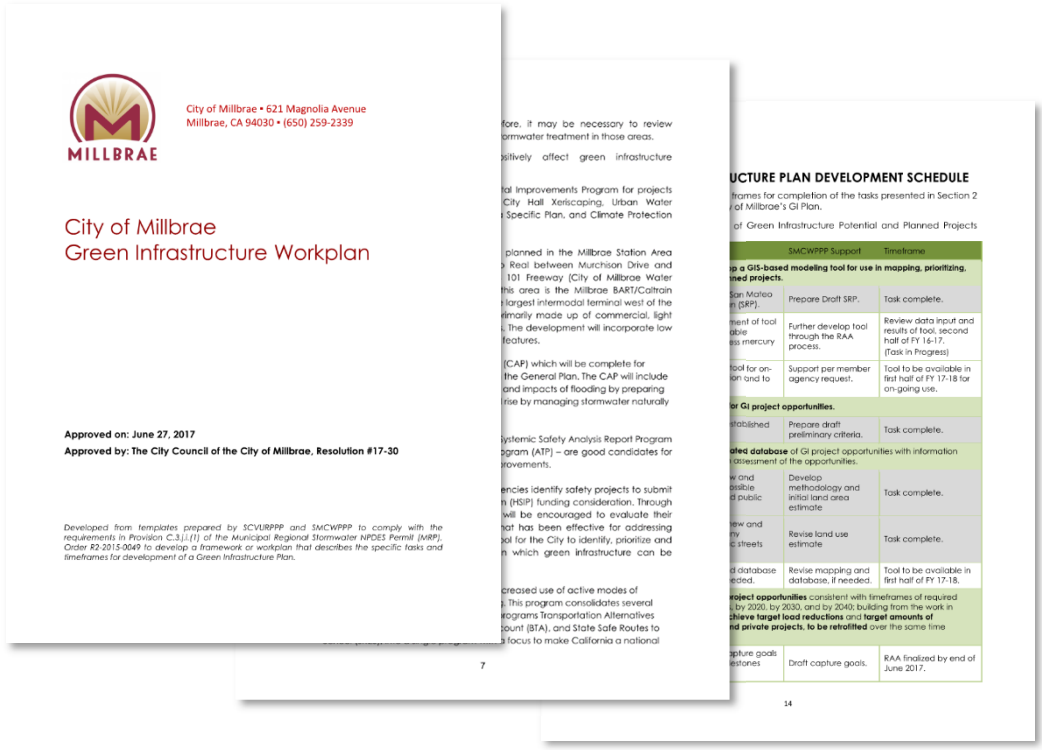
In order to provide feedback on GI TAC deliverables in a timely manner, an unofficial interdepartmental task force headed by the Public Works Department which consisted of representatives of various other departments was formed. At various stages in the planning process, Public Works coordinated with Planning/Community Development, Parks, the City Attorney, the City Manager's Office, and City Council to discuss the planning requirements and work products.

Rain garden located at City Hall.

1.3.2 Workplan Development and Adoption

The MRP required all Permittees to adopt a GI Workplan by June 30, 2017 and submit it to the SFRWQCB by September 30, 2017. The workplan consisted of a framework for completing the GI Plan and included a statement of purpose, tasks, and timeframes to complete the required elements of the GI Plan.

The City of Millbrae's GI Workplan was approved by City Council as a consent item on June 27, 2017, as Resolution #17-30. At this City Council meeting, City staff and their consultants provided a presentation to explain GI and the MRP GI Planning requirements.



City of Millbrae GI Workplan, adopted June 27, 2017.

1.3.3 Alignment with City Plans, Policies, and Programs

GI implementation aligns with existing City plans, policies, and programs, such as the General Plan and Climate Action Plan, because it can help to provide multiple benefits to the community, as listed in Section 1.1.4.

Chapter 7, "Integration with Other Planning Documents", describes how existing planning documents coordinate with the GI Plan, and which planning documents will be updated to further support implementation of GI.

Chapter 10, "Implementation Approach", describes how the City's standard operating procedures, Municipal Code, maintenance program, and internal policies help to support implementation of GI.

1.3.4 Outreach and Education

Chapter 9, "Outreach and Education", describes which outreach and education efforts were conducted at a City- or County-wide level throughout the GI Plan development process. Chapter 9 also describes the education and outreach strategy moving forward to raise awareness about water quality and pollution as well as to help promote the implementation of GI.

"Keep our city clean" banner located in downtown Millbrae.

1.3.5 Project Oversight

The City convened interdepartmental meetings with affected department staff, including the Public Works and Planning Departments as well as Management Staff, to discuss and develop the GI Plan.

Additional oversight was provided by the GI TAC, which provided City staff with information and feedback about various GI Plan elements. In order to develop a GI Plan which is consistent with others being developed in San Mateo and Santa Clara Counties, this GI Plan was developed using a combination of a GI Plan template provided by SCVURPPP and the model table of contents provided by SMCWPPP.

2.0 AGENCY DESCRIPTION AND BACKGROUND

2.1 Background and Land Use

The City of Millbrae is in San Mateo County, just west of the San Francisco Bay. The City borders San Bruno to the north as well as Burlingame to the south and is adjacent to the San Francisco International Airport. The distance between the north and south City limit line is approximately 2.05 miles. The City is also bounded by the Bayshore (US-101) Freeway to the east and Skyline Boulevard to the west; the distance between the east and west City limit line is approximately 1.7 miles.

Figure 6. *City of Millbrae Regional Setting.*[9]

[9] *Millbrae General Plan Update: Public Review Draft Existing Conditions Report. (*2019). Department of Community Development. City of Millbrae.

The City maintains roughly 3,000 trees and 14 parks totaling 124.2 acres, including open space areas. A private country club, Green Hills Country, provides a 107-acre green belt in the center of the City that is the home of many animals, such as the red fox. It is also one of the only areas of the City where natural creeks still flow above ground. Most of the City's land is used for single-family residential homes.

The existing land use varies throughout the City, generally following the pattern below (Table 4):

- **West of El Camino Real.** Most of the mixed use, commercial, and industrial use areas are closer to the El Camino Real corridor. Further west, the land area is mostly residential, with various parks and schools scattered throughout.
- **East of El Camino Real.** The east side of the corridor north of Millbrae Avenue is mainly light industrial and commercial, including a Millbrae Lumberyard site, auto repair shops, and food establishments. Just north of the Millbrae Station are several small residential subdivisions. Further east, past Bayshore Freeway, there are two large hotels (Aloft San Francisco and The Westin) as well as a small pocket of commercial/industrial land use.

Table 4. *Existing Land Use.*[10]

TABLE 3-1
EXISTING LAND USE[1]
Millbrae

Existing Land Use	Acreage	Percent of Total
Single-Family	943.5	59.0%
Duplex/Triplex/Fourplex	32.3	2.0%
Apartment	65.0	4.1%
Mixed Use	5.6	0.4%
General Commercial	75.8	4.7%
Office	5.0	0.3%
Industrial	12.7	0.8%
Parks and Open Space	124.2	7.8%
Public/Quasi-Public/Utility	223.5	14.0%
Vacant	3.6	0.2%
Other[2]	107.0	6.7%
Total	**1,598.2**	**100.0%**

[1]The table does not include streets, highways, or other transportation corridors.
[2]The Other category is the Green Hills Country Club, which is a privately-owned country club.
Source: San Mateo County Assessor's Office, 2016; Mintier Harnish, 2016.

[10] *Millbrae General Plan Update: Public Review Draft Existing Conditions Report. (*2019). Department of Community Development. City of Millbrae.

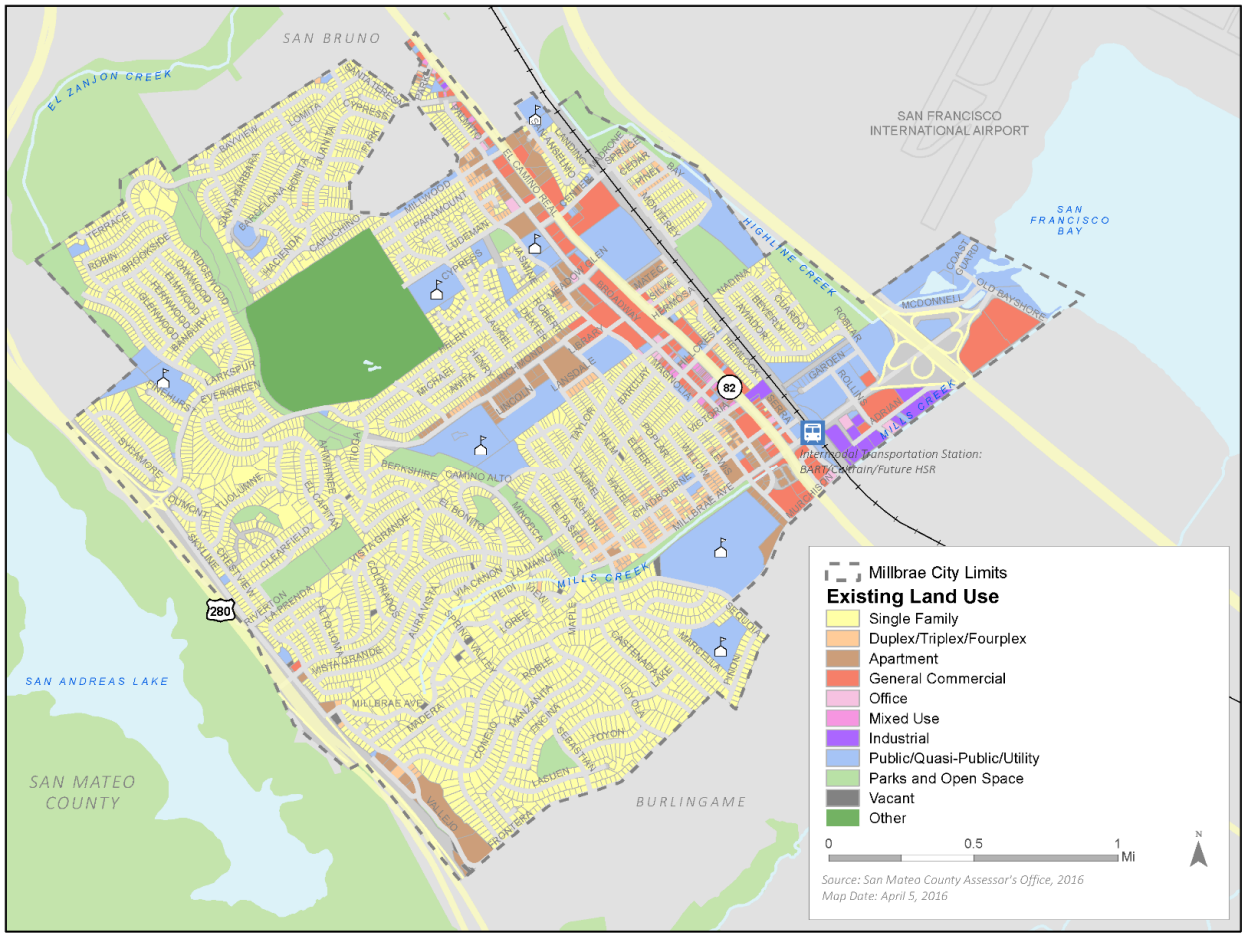


Figure 7. *Millbrae Existing Land Use Map.*[11]

2.2 Water Resources

The City's drainage system consists of a network of 21 miles of storm drains and 3 miles of open creeks and ditches. Approximately 41% of the Millbrae Creek is under roads and residential homes, and it has a total of 13 outfalls, 10 of which have no flow, and 3 of which have a trickle flow. The City does not currently divert or treat stormwater for beneficial reuse on a municipal level. There are several riverine features throughout the City that intermittingly flood after rain events. Some of these features are natural—for example, the riverine features at Junipero Serra County Park—while others are manmade or highly altered, such as the drainage canals adjacent to Highway 101 (see Figure 8).

[11] *Millbrae General Plan Update: Public Review Draft Existing Conditions Report.* (2019). Department of Community Development. City of Millbrae.

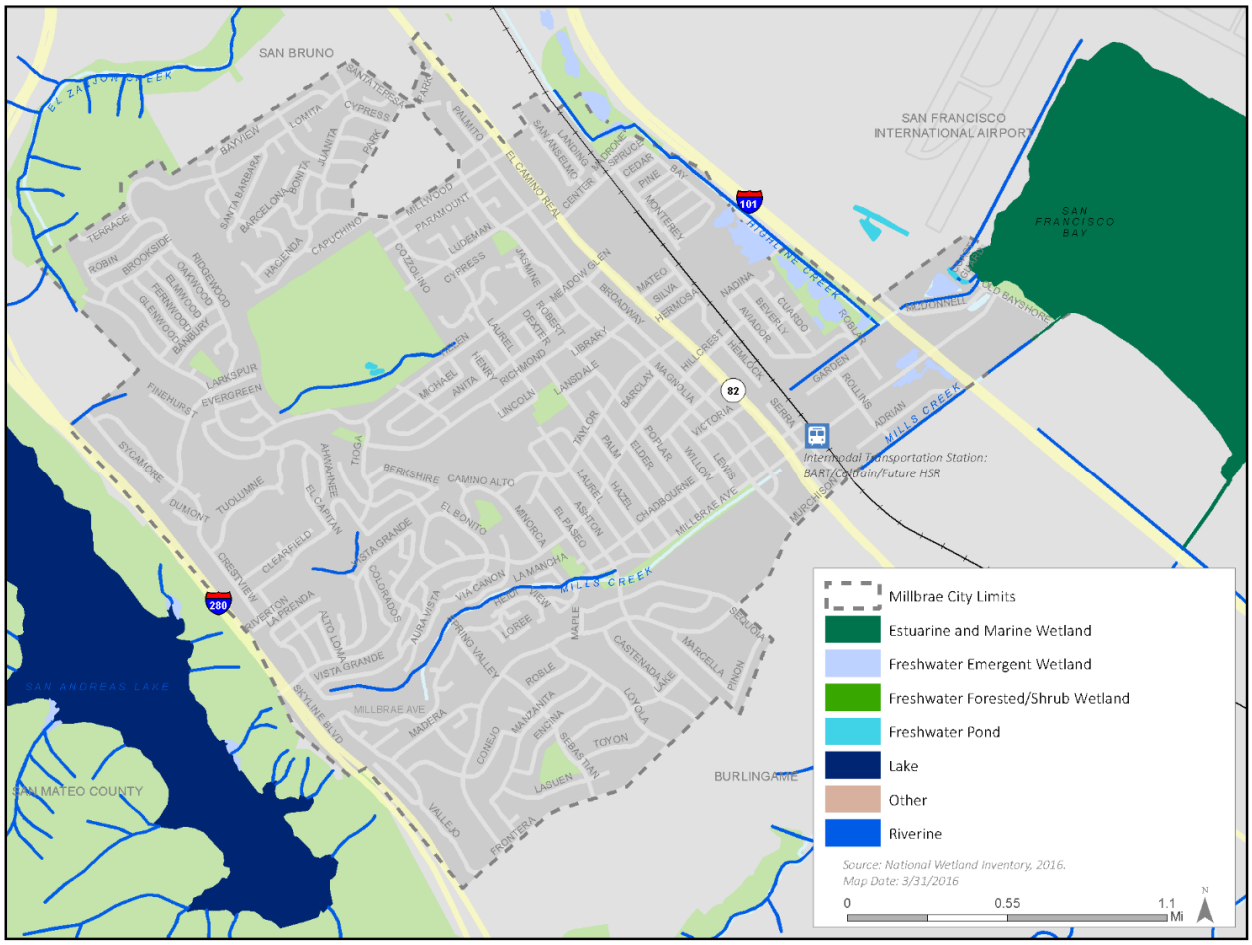


Figure 8. *Millbrae Wetlands and Other Waters Map.* [12]

2.3 Transportation

Regional vehicular access to the City is provided by Interstate 280 passing along the western edge of the City, Highway 101 passing along the eastern perimeter, and State Route 82 (El Camino Real) which passes through the heart of the City. The Millbrae Station is a regional transit hub with connections to Caltrain, Bay Area Rapid Transit (BART), San Mateo County Transit District (SamTrans), and corporate shuttles. With these major connections, Millbrae Station is the largest intermodal station west of Mississippi River, and services over 10,000 passengers per weekday. The City's existing bikeways include Class I dedicated bike paths, limited Class II bike lanes, and Class III signed bike routes. The Class I bike paths include sections of the regional Spur Trail, Crystal Springs Trail, and the Bay Trail.

[12] *Millbrae General Plan Update: Public Review Draft Existing Conditions Report.* (2019). Department of Community Development. City of Millbrae.

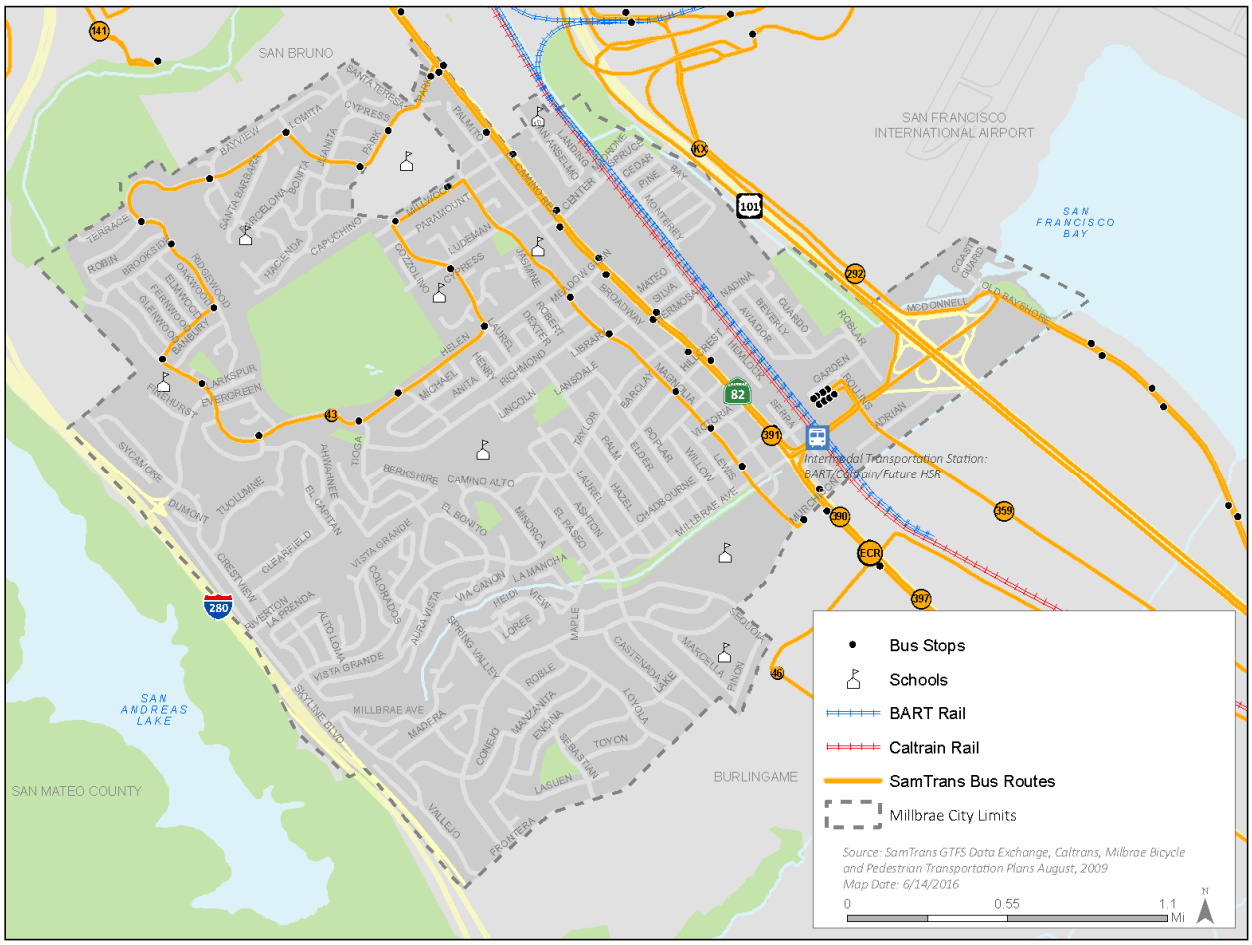


Figure 9. *Millbrae Street Classification Map.* [13]

2.4 Population and Growth Forecasts

According to the 2015 California Department of Finance population estimate E-5 Report, the City has a population of 22,898.[14] The City experienced relatively stable and slow population growth from 2000 to 2015 with an annual growth rate of 0.07 percent.

According to the U.S. Census Bureau 2011-2015 American Community Survey 5-Year Estimates[15], Millbrae has a population of 22,416 and an average household size of 2.70. Of the 22,416 residents, 19.6% are under the age of 18, 6.6% are between 18 and 24, 23.7% are between 25 and 44, 31.4% are between 45 and 64, and 18.7% are 65 or older. The median household income was $93,777 in 2015. Top employers in

[13] *Millbrae General Plan Update: Public Review Draft Existing Conditions Report.* (2019). Department of Community Development. City of Millbrae.

[14] *Estimates.* State of California. Department of Finance. Accessed 2019. http://www.dof.ca.gov/Forecasting/Demographics/Estimates/.

[15] *American FactFinder.* United States. Census Bureau. Accessed 2019. https://factfinder.census.gov/faces/nav/jsf/pages/index.xhtml.

the City of Millbrae include the City and County of San Francisco, Millbrae School District, Starwood Hotels & Resorts Worldwide, Best Western El Rancho Inn & Suites, and the City of Millbrae.

2.5 Characteristics that Impact Green Infrastructure Implementation

Specific City characteristics that may restrict GI implementation include the following:

- **Groundwater Issues.** The seasonal groundwater level in Millbrae is high due to the City's proximity to the San Francisco Bay. In addition, the soil types in the City have low permeability rates. Therefore, use of infiltration measures is typically not feasible, especially in the lower elevation areas closer to the San Francisco Bay.
- **Flooding Issues.** Some areas of the City have a high potential for flooding. These areas include Hillcrest Basin near City Hall, Landing Lane west of the train tracks, and Bayshore Boulevard near the BART Station.
- **Storm Drain Issues.** The City's main trunk storm drain line is shallow, with no cover available over the portion of the storm drain on Broadway and El Camino. Biotreatment measures may not allow for gravity drainage in some areas, requiring the use of bubble-up measures—which are not desirable due to the high potential for standing water—or pumps, which are not desirable due to their noise, high maintenance, and likelihood for mechanical failure. Therefore, it may be necessary to review alternative approaches or strategies for stormwater treatment in those areas.
- **Highly Residential.** The City's land use consists of over 60% residential areas, made up of primarily single-family homes. Single-family homes are not subject to Provision C.3 treatment requirements, except when constructed as part of a larger development. Therefore, opportunities to implement GI as part of Provision C.3 in these areas will be limited.
- **Difficult Terrain.** The City's residential areas to the west are comprised of hilly terrain, which is not ideal for the installation of many types of GI measures, such as permeable pavers, and can make the installation of stormwater planters more difficult and expensive.

Specific City characteristics that positively impact GI implementation include the following:

- **Capital Improvement Program.** The City will continue to screen its Capital Improvement Program for projects that may have GI potential.
- **Storm Drain Master Plan.** The City completed a storm drain master plan in August 2018 which identified storm system deficiencies. It may be possible to coordinate storm system improvements with GI.
- **El Camino Real and Downtown Specific Plan.** The City is developing an El Camino Real and Downtown Specific Plan which is focused on improving the safety and aesthetics of El Camino Real as well as the Downtown and Station Areas as part of the Grand Boulevard Initiative. These

improvements promote healthier communities, a vibrant visitor experience, and a high quality of life for residents. The El Camino Real corridor will have a mix of new development, including multifamily residential, offices, hotels, conference/meeting spaces, cultural amenities, retail, and restaurants. The Downtown area will have restaurants, retail, offices, and upper level residences. The Station area is a transit hub, and will be developed to include offices, a hotel, retail, restaurants, and multifamily residential housing. As these areas are developed, there will be opportunities to implement GI, with a goal of having consistent street planting and other landscape elements within the Specific Plan Area.

Bioretention area located at the Millbrae library.

3.0 GREEN INFRASTRUCTURE MILESTONES

3.1 Regulatory Background

Provision C.3.j of the MRP specifies that the GI Plan should include the following:

> *"Targets for the amount of impervious surface, from public and private projects, within the Permittee's jurisdiction to be retrofitted over the following time schedules, which are consistent with the timeframes for assessing load reductions specified in Provisions C.11 and C.12: (i) By 2020; (ii) By 2030; and (iii) By 2040."*

This chapter discusses the required load reductions to be achieved via Green Infrastructure (GI) at the Countywide level and includes various approaches that can be taken at the City and/or County level to achieve load reductions within specified compliance periods. The load reduction performance criteria are established through Provision C.11.c (for mercury) and Provision C.12.c (for PCBs).

3.2 Determining Load Reduction Milestones

3.2.1 Reasonable Assurance Analysis (RAA) Background

Collectively, San Mateo County Permittees (including the City of Millbrae) prepared a Reasonable Assurance Analysis (RAA) to demonstrate quantitatively that the proposed control measures will result in sufficient load reductions to meet Total Maximum Daily Load (TMDL) Waste Load Allocations (WLA) and to set goals for the amount of GI needed to meet the portion of PCB and mercury load reduction the MRP assigns to GI (SFBRWQCB 2015). The RAA allows the City to engage in a cooperative effort with other San Mateo County municipalities while also operating under City-specific stormwater quality goals and the City's unique implementation strategies, tools, and processes set forth in this GI Plan.

The RAA is a tool for San Mateo County Permittees to use to accomplish the following:

1. Determine a quantitative City-specific 2040 load reduction goal. If each municipality meets this goal, then San Mateo County will collectively have met the performance criteria of the MRP.
2. Establish sample "recipes" for achieving load reduction through a combination of existing projects, future new and redevelopment, regional projects, and green streets.
3. Evaluate the financial resources needed to meet the 2040 goal and determine the feasibility of meeting this goal based on City context, knowledge, and opportunities.
4. Serve as a discussion tool to facilitate conversations about countywide collaboration, such as the pooling of funds to construct regional projects or the use of a credit trading program.
5. Project the amount of GI to be constructed via future new and redevelopment.
6. Assist the City in forecasting the relative ease or difficulty of green street implementation, based on a prioritization of green street opportunities.

7. Facilitate the creation of a tracking tool for GI implementation by establishing goals that are easily tracked and measured.

The EPA RAA Guide provides an example of three (3) differing perspectives for defining reasonable assurance (USEPA 2017):

- **Regulator Perspective.** Reasonable assurance is a demonstration that the implementation of a GI Plan will result in sufficient pollutant reductions over time to address TMDL WLAs or other targets specified in the MRP.
- **Stakeholder Perspective.** Reasonable assurance is a demonstration that specific management practices are identified with sufficient detail and implemented on a schedule to ensure that necessary improvements in water quality will occur.
- **Permittee Perspective.** Reasonable assurance is based on a detailed analysis of the TMDL WLAs and associated MRP targets themselves, and a determination of the feasibility of those requirements. The RAA may also assist in evaluating the financial resources needed to meet pollutant reductions based on schedules identified in the MRP.

The SMCWPPP RAA was developed by Paradigm Environmental, and consists of two (2) reports:

- **Phase I Baseline Modeling Report.** Provides documentation of the development, calibration, and validation of the baseline hydrology and water quality model, and the determination of PCB and mercury load reductions to be addressed through GI implementation (SMCWPPP 2018b).
- **Phase II Green Infrastructure Modeling Report.** Provides documentation of the application of models to determine the most cost-effective GI implementation on a municipality-specific basis, setting stormwater improvement goals for the GI Plan (SMCWPPP 2019c).

Per the EPA "Developing Reasonable Assurance" guide, stormwater NPDES programs are shifting from ensuring compliance through a modeling- and analytical-based approach to water quality requirements to a focus on the specific stormwater management strategies and processes that are necessary over the long term to achieve water quality goals. The RAA acts as a benchmarking strategy and process for assessment of the City's progress in implementing GI. The planning process inputs and outputs of a reasonable assurance analysis are summarized in Figure 10.

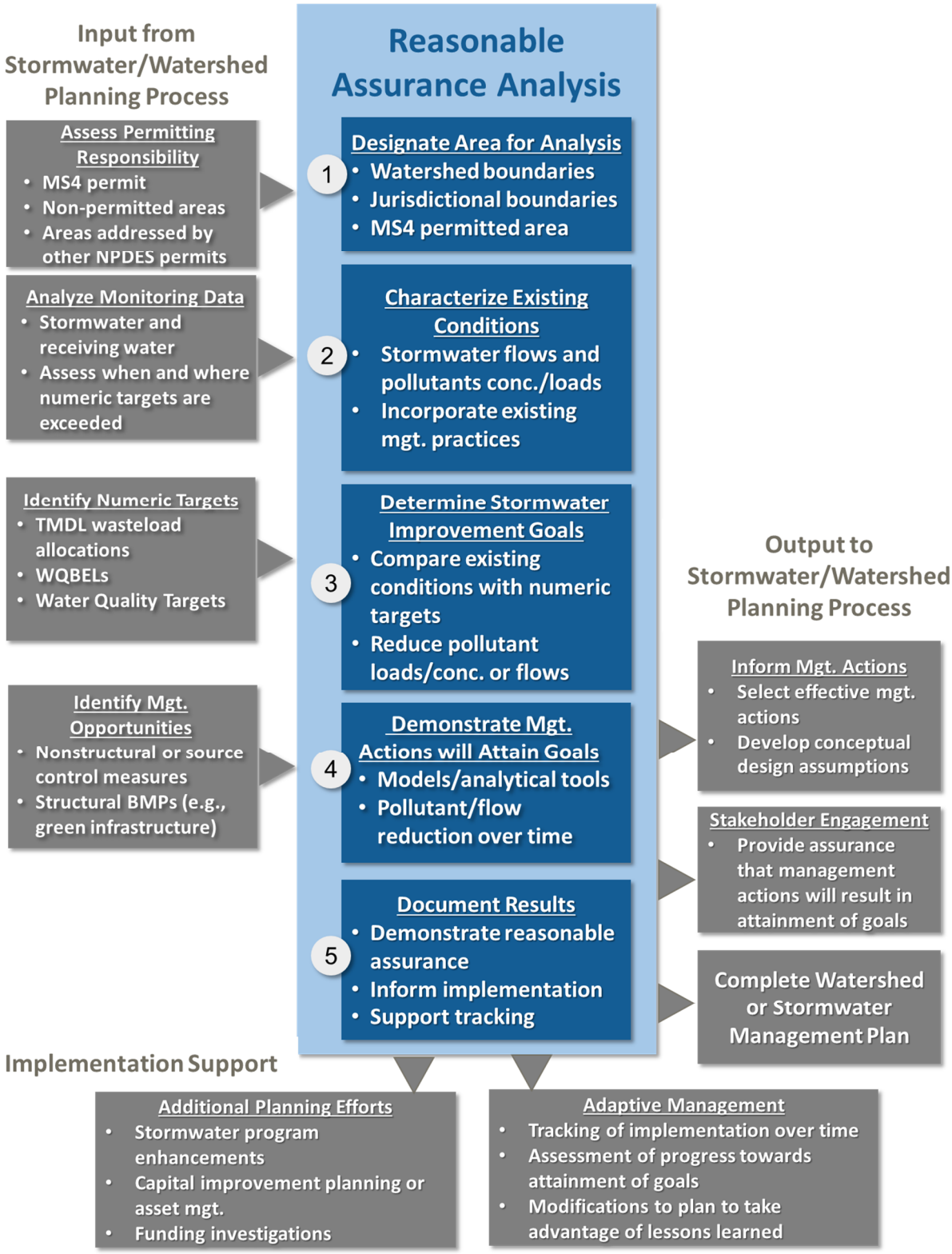


Figure 10. *Reasonable Assurance Analysis Process.*[16]

[16] *Developing Reasonable Assurance: A Guide to Performing Model-Based Analysis to Support Municipal Stormwater Program Planning.* (2017, February). Paradigm Environmental. USEPA.

3.2.2 RAA Modeling Process

Pollutants, like PCBs and mercury, attach to cohesive sediments, like silts and clays, and do not settle out before discharging to the Bay. Using data such as rainfall levels, land use composition, impervious surface area, elevation, slopes, evaporation and infiltration, San Mateo County subwatersheds were modeled by Paradigm Environmental to establish stormwater runoff and total sediment loads. By reducing the amount of cohesive sediment with GI projects, the pollutants are also reduced.

Using the runoff and sediment load as an input, the watersheds were modeled using the System of Urban Stormwater Treatment & Analysis (SUSTAIN), which was developed by the EPA's Office of Research and Development. This software is a cost-benefit optimization model that runs iteratively to evaluate various GI opportunities.

The basic modeling system of the RAA is further described in Figure 11.

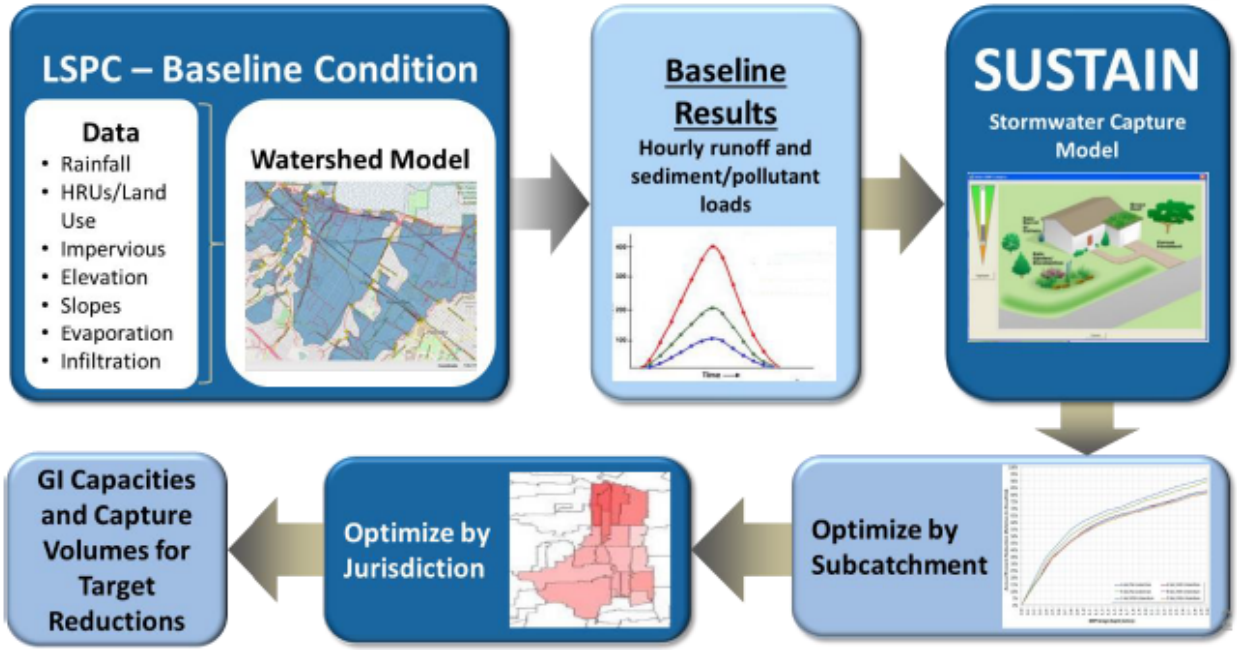


Figure 11. *Reasonable Assurance Analysis Modeling (SMCWPPP 2018a)*[17].

3.2.3 Determination of Water Quality Goals

As discussed in Section 3.2.1, depending on the perspective of the regulators, stakeholders, or Permittees, the purpose and expectations of the RAA can vary in terms of how reasonable assurance is demonstrated. As a result, the output from the RAA must consider multiple perspectives and strike the right balance between detail and specificity while still leaving ample opportunity to allow for future adaptive management. The following are key considerations for the RAA output:

[17] *Quantitative Relationship Between Green Infrastructure Implementation and PCBs/Mercury Load Reduction.* (2018, June). SMCWPPP 2017-18 MRP Annual Report. Paradigm Environmental.

- **Demonstrate PCBs and Mercury Load Reductions.** The primary goal of the RAA is to quantitatively demonstrate that GI Plans and Control Measure Implementation Plans will result in load reductions of PCBs and mercury sufficient to attain their respective TMDL WLAs and the component stormwater improvement goals to be achieved with GI. Development of these milestones is further described in Section 3.2.4.
- **Develop Metrics to Support Implementation Tracking.** The MRP (Provision C.3.j) also requires tracking methods to provide reasonable assurance that TMDL WLAs are being met. Through C/CAG's current effort preparing a Sustainable Streets Master Plan for San Mateo County, a tracking tool is under development that will enable calculation of metrics consistent with the results of the RAA and additional metrics relevant to sustainable street implementation. The tracking tool is planned for completion in 2020. This is further described in Section 5.5.
- **Support Adaptive Management.** Given the relatively small scale of most GI projects (e.g., use of LID on an individual parcel or conversion of a single street block converted to a green street), numerous individual GI projects are needed to address pollutant reduction goals. All GI projects will require site investigations to assess feasibility and costs. The RAA provides a preliminary investigation of the amount of GI needed spatially (e.g., by subwatershed and municipal jurisdiction) to achieve the countywide pollutant load reduction goal. The RAA sets the GI Plan "goals" in terms of the amount of GI implementation over time to address pollutant load reductions. As GI Plans are implemented and more comprehensive municipal engineering analyses (such as detailed, site-specific assessments of GI feasibility) are performed, the adaptive management process is vital to ensuring that goals are met. In summary, the RAA informs GI implementation goals, but the pathway to meeting those goals is subject to adaptive management. **Adaptive management is further discussed in Section 5.6.**

The RAA considered multiple alternative scenarios that can inform GI implementation and direct the adaptive management process. These scenarios demonstrate multiple needs, such as the completion of further research, collaboration among multiple Permittees, and incorporation of lessons learned in order to gain efficiencies and maximize the cost-effectiveness of GI to reduce pollutant loads over time.

3.2.4 PCBs and Mercury Load Reduction Milestones

The MRP specifies a PCB and mercury wasteload allocation which is assigned to San Mateo County based on population. The City of Millbrae's wasteload allocation of PCBs and mercury was derived through the RAA, based on population as well as area draining to the San Francisco Bay relative to other Permittees. From this baseline load, the contribution of PCBs and mercury from open space areas, sites covered under other discharge permits (such as schools and other Phase II permittees, as well as sites covered under an

industrial discharge permit), Caltrans right-of-way, and areas that drain to the Ocean were removed. The remaining amount of wasteload allocation is what is controlled by the MRP in urban areas.

Based on the baseline hydrology and water quality model, the RAA determined that a 17.6% reduction in PCB loads is needed to meet the GI implementation goals established by the MRP. Zero reduction in mercury loads was determined to be needed from MRP areas because baseline loads were predicted to be below the TMDL WLA for San Mateo County. As a result, a 17.6% reduction in PCB loads compared to existing conditions is established as the primary pollutant reduction goal for the GI Plan.

Figure 12 represents various model scenarios that were considered during the RAA development. Scenarios 1 and 2 are explored further in this chapter. Scenarios 3 and 4 are not recommended due to the uncertainties involved in terms of how PCB source areas are represented in the model, which would require more monitoring and analysis in the future to gain an improved understanding of PCB source areas and the ability to target these areas with GI. PCBs are difficult to model, track, and sample compared to cohesive sediment.

Load Reduction Objective	Percent of Total GI Cost to Achieve Reduction Objective		
	Jurisdictional	Countywide	*Total Savings (Jurisdictional vs. Countywide)*
Cohesive Sediment 17.6% Reduction	**Scenario 1**	**Scenario 2**	→ *Savings*
Total PCBs 17.6% Reduction	**Scenario 3**	**Scenario 4**	→ *Savings*
Total Savings (Sediment vs. PCBs)	↓ *Savings*	↓ *Savings*	↘ *Overall Savings*

Figure 12. *Model scenarios objectives and cost-benefit evaluation (SMCWPPP 2018a).*

- **Scenarios 1 and 2.** With a cohesive sediment load reduction objective, Scenarios 1 and 2 represent the most conservative approaches. Those scenarios assume that given the uncertainties about PCB source areas, targeting an overall 17.6% load reduction of cohesive sediment in general (silts and clays) achieves the PCB load reduction objective for GI.

  Since PCBs are generally understood to be transported with cohesive sediment (e.g., silt and clay), cohesive sediment load can serve as a surrogate on which to base a load reduction target. The RAA considers a 17.6% reduction of cohesive sediment load as a more conservative surrogate until a better understanding is reached in terms of specific PCB source areas within the County. PCB source areas can be targeted for source control measures or GI implementation, likely resulting in greater effectiveness for GI to reduce PCB loads in those areas, and thus reducing the overall amount of GI needed to meet the load reduction target.

- **Scenarios 3 and 4.** These scenarios assume that PCB sources are spatially distributed based on analysis of land use types. The cost-benefit optimization process targets those areas as having the highest likelihood of PCB sources.

By targeting a total sediment load reduction rather than a pollutant-specific load reduction (such as reduction in level of PCBs), GI installed at any site in San Mateo County which drains to the San Francisco Bay can help contribute to the load reduction.

Bioretention area located at the Millbrae BART station parking lot. This bioretention area will be reconstructed and restored with the BART transit-oriented development (TOD) projects.

3.3 Approach to Load Reduction Milestones

3.3.1 Jurisdictional vs. Countywide Approach

There are two (2) potential approaches the various municipalities within San Mateo County may consider:

- **Jurisdictional Approach.** Each municipality would be individually responsible for a 17.6% sediment load reduction that is proportional based on population and the amount of area which drains to the San Francisco Bay.
- **Countywide Approach.** Each municipality agrees to reduce overall PCBs within the County by focusing on municipalities with the potential to implement more efficient and numerous GI opportunities.

The Countywide approach is projected to result in a cost reduction for each municipality and considers implementation of GI throughout San Mateo County. Some agencies will have more capacity to implement GI, while others will have less. A countywide approach is not only more cost effective, but also provides a vehicle for collecting funding for regional project opportunities, the costs of which can be shared by multiple jurisdictions. It also provides a vehicle for credit trading between agencies. Refer to the "Green Infrastructure Funding Nexus Evaluation" (SCI Consulting Group and Larry Walker Associates, January 2019) for more information about credit trading.

The RAA allows for the possibility of credit trading by providing multiple management metrics for GI, such as impervious area to be treated in acreage, and GI capacity in acre-feet. **Refer to Section 3.4.3 for more information about the RAA's management metrics.**

3.3.2 Modeled Green Infrastructure Opportunities

For the purposes of the RAA, GI represents a group of structural control measures that provide similar processes for the capture, infiltration, and/or treatment of urban runoff prior to discharge to receiving waters, such as bioretention areas and permeable pavers. **For more information about the methods used to identify and screen potential projects, refer to Chapter 4, "Project Identification and Prioritization".** GI opportunities incorporated into the model include the following:

1. **Existing Projects.** Stormwater treatment measures and GI projects that have been implemented since FY -2004/05. This is primarily all the C.3 Regulated Projects that were mandated to treat runoff via Provision C.3 of the MRP, but also includes any public green street or other demonstration projects that were not subject to Provision C.3 requirements. For Regulated Projects in the early years of C.3 implementation, stormwater treatment may have been achieved through non-GI means, such as underground vault systems or media filters.

2. **Future New and Redevelopment (Low Impact Development).** Low impact development uses a suite of technologies intended to imitate pre-urbanization (natural) hydrologic conditions. LID captures and treats runoff before it can reach downstream waterbodies. LID projects are located on discrete parcels and sites, and do not include green streets (see below for further information). Examples include green roofs, bioswales, bioretention areas, permeable pavement, and infiltration trenches. These are Regulated Projects that are subject to Provision C.3 requirements to treat runoff via GI per the MRP. The RAA modeled these projects based on spatial projections of future new and redevelopment tied to regional models for population and employment growth. **For a map of prioritized LID projects, refer to Appendix B.**

3. **Regional Projects.** Regional stormwater capture projects consist of facilities that capture and treat stormwater from offsite. The primary objective of regional projects is often flood attenuation, but many also contain a water quality treatment or infiltration component. Common examples include detention basins, retention basins, and subsurface infiltration galleries. Ideal locations are large public spaces, such as public parks, sports fields, parking lots, and school

grounds (SMCWPPP 2017). The San Mateo County Stormwater Resource Plan (SRP) identifies projects which provide regional capture and infiltration/treatment of stormwater and includes conceptual design to support further planning and designs. This list of regional projects has been further refined since the SRP was developed to update the RAA. **For a map of prioritized regional projects, refer to Appendix B.**

4. **Green Streets.** Green streets consist of stormwater capture infrastructure that is implemented in public rights-of-way. Green streets projects include installation of permeable pavement, bioretention areas, and stormwater curb extensions. The SRP identifies and prioritizes opportunities throughout San Mateo County for retrofitting existing streets with GI in public rights-of-way. This prioritization was refined with the RAA, using feedback from the GI TAC. The green streets were further broken up into high, medium, and low priority categories to represent the projects which have the greatest (high priority) or least (low priority) potential for a cost-effective installation of a GI measure. **For a map of prioritized green streets projects, refer to Appendix B.**
5. **Other GI Projects (to be determined).** Other types of GI projects on publicly-owned sites represent a combination of either additional parcel-based GI or other Regional Projects. The SRP screens and prioritizes public parcels for opportunities for onsite LID and Regional Projects. These opportunities need further investigation to determine those with the greatest potential.

Together, modeled GI opportunities listed above present the "recipe" for attaining the water quality milestones. The contribution from each project category is simulated in the RAA, but the actual contribution will depend upon the opportunities which arise through development, through CIP projects, and through regional collaboration between now and 2040. Figure 13 represents how the GI opportunities are sequenced to first take advantage of the projects with the lowest implementation cost before incorporating the use of more costly GI opportunities.

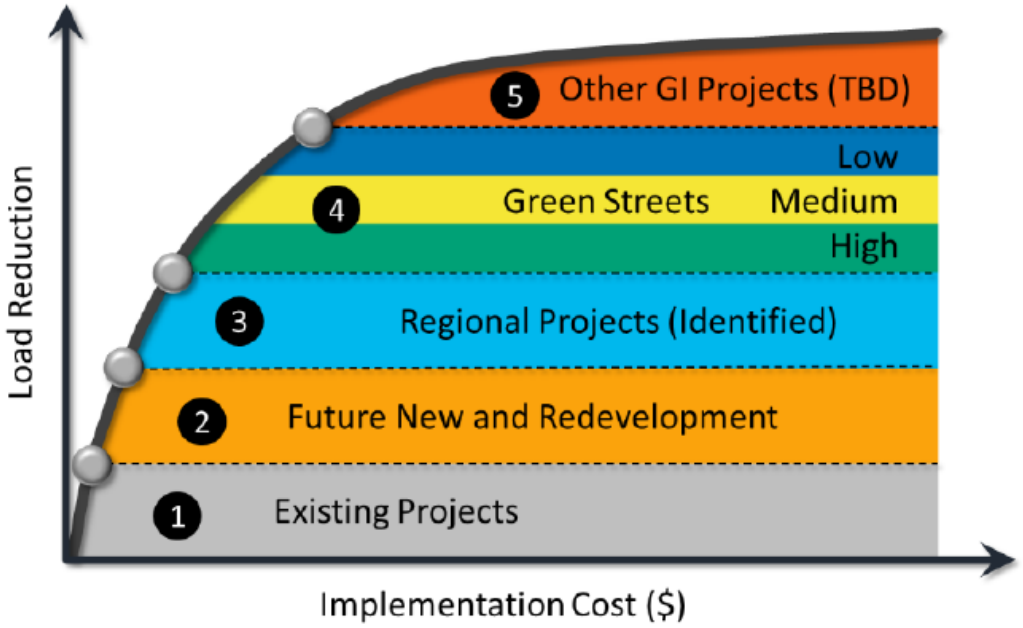


Figure 13. *Example implementation recipe showing general sequencing of GI projects.*[18]

3.4 City-Specific Water Quality Milestones

As a result of the RAA, each municipality is provided a range of options to achieve a 17.6% reduction in sediment. The parameters provided include the (1) volume of annual runoff to be managed, (2) area of impervious surface to be managed, and (3) capacity of GI measures to be constructed. The RAA presents a "recipe" for how much GI might be constructed in each area of the City, but the actual implementation of GI is dependent upon opportunities and funding.

[18] *Quantitative Relationship Between GI Implementation and PCBs/Mercury Load Reduction.* (2018, June). 2017-18 MRP Annual Report. Paradigm Environmental. SMCWPPP.

3.4.1 Jurisdictional Approach

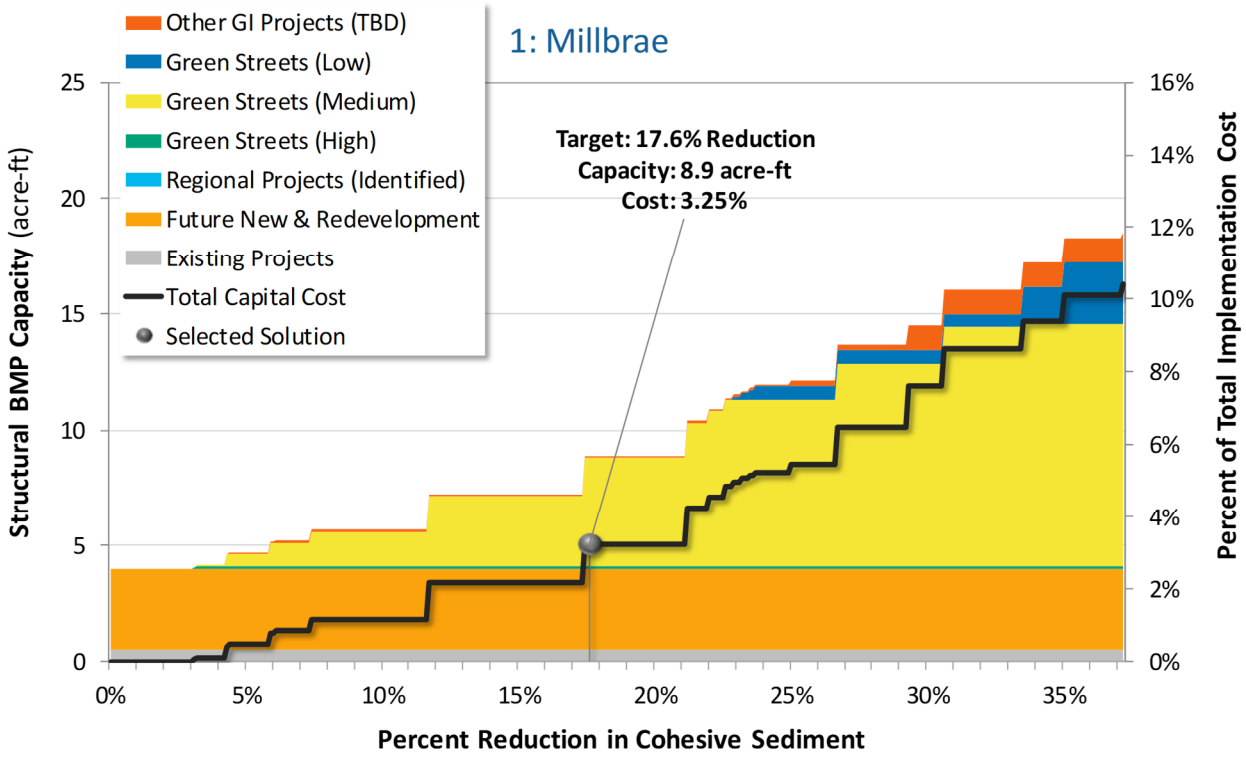


Figure 14. *Optimization summary for Millbrae, sediment goal (by jurisdiction).*

Figure 14 displays the most cost-effective path for the City to reach the 17.6% sediment reduction goal. The left Y-axis is paired with the colored bars and displays the structural Best Management Practices (BMP) capacity in acre-feet. Structural BMP capacity is defined as the volume of the theoretical GI measure(s) necessary to achieve a target load reduction. The X-axis displays the percent reduction in cohesive sediment. The right Y-axis is paired with the black line and displays the percent of the total countywide implementation cost that would be paid by the City.

To read the graph, follow the black line until you reach the desired point along the X-axis (in the above graph, this is 17.6% sediment reduction). Imagine a vertical line slicing through the entire graph at this point. The highest part of this line that touches a colored bar represents the structural BMP capacity required to reach the sediment reduction goal (in the above graph, this is 8.9 acre-feet). These 8.9 acre-feet will be achieved via existing projects (about 0.5 acre-feet), future new developments and redevelopments (about 3.5 acre-feet), high priority green streets (about 0.1 acre-feet), medium-priority green streets (about 4.7 acre-feet), and other GI projects (about 0.1 acre-feet). Now return to the selected point along the black line and imagine a horizontal line slicing through the entire graph at this point. Follow this line to the right Y-axis to find the percent of the total countywide cost that would be paid by the City under the proposed plan (in the above graph, this would be 3.25%).

As the percent reduction in sediment increases, the acre-feet of structural BMP capacity as well as the percent of total implementation cost also increase to achieve the desired level of sediment reduction. The

most efficient methods are used first up to their capacity and then less efficient methods follow. For example, in the above graph, high priority green street projects have reached maximum capacity before any low priority green street projects are introduced, and these in turn are at near-capacity before any other GI projects are introduced.

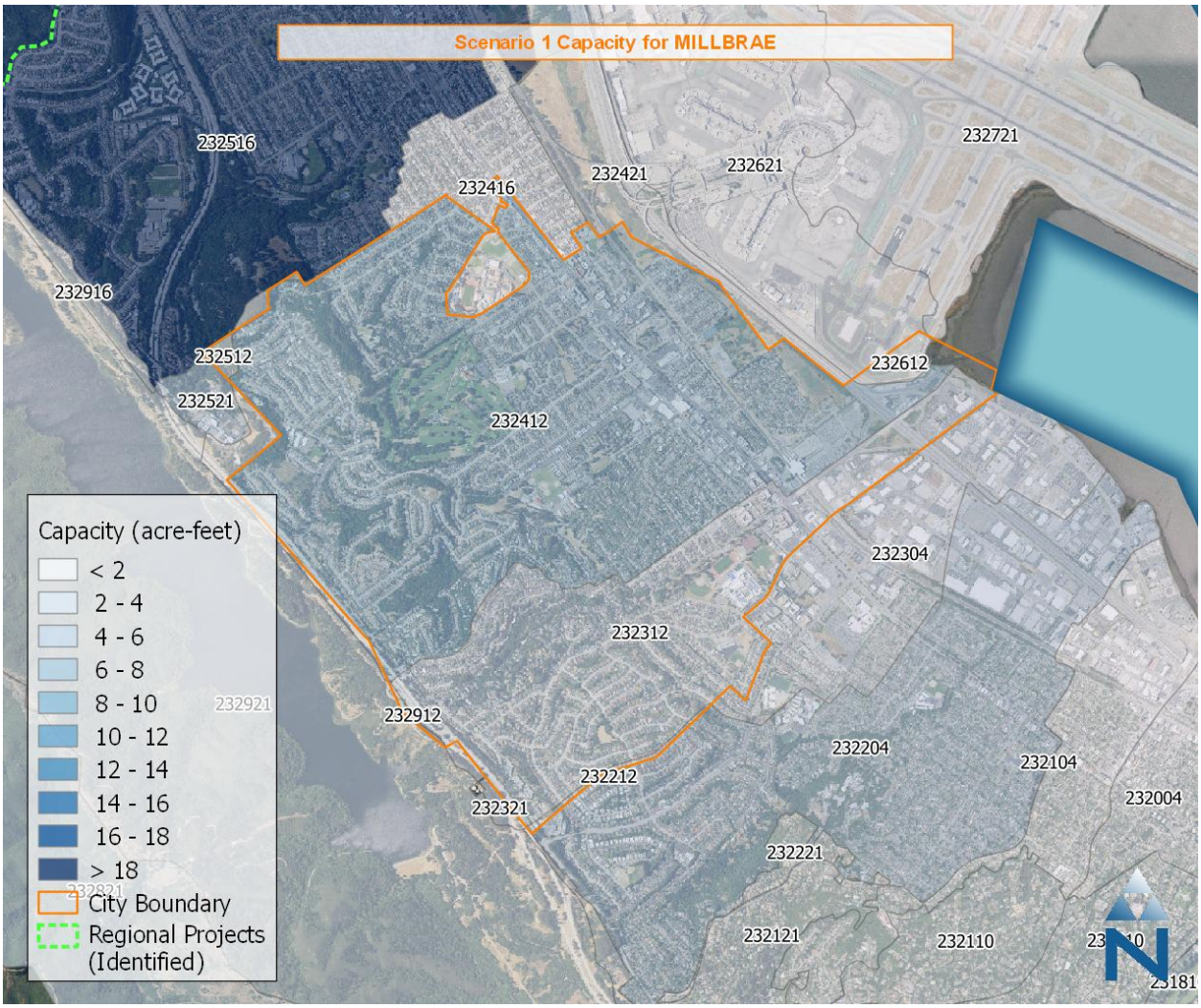


Figure 15. *Scenario 1: Millbrae, sediment reduction goal (by jurisdiction).*

The above map (Figure 15) shows the various subwatersheds located within the City, along with the planned structural BMP capacity of each subwatershed area to be utilized within the City under the jurisdictional approach.

Table 5. *Scenario 1, Millbrae: Sediment Reduction Goal (By Jurisdiction, with Regional Projects).*

Subwatershed ID	Management Metrics for GI			GI Capacity to Achieve 17.6% Reduction Target (Capacity expressed in units of acre-feet)							
				Existing/Planned			Green Streets				
	% Load Reduction PCBs (Annual)	Annual Volume Managed (acre-ft)	Impervious Area Treated (acres)	Existing Projects	Future New & Redevelopment	Regional Projects (Identified)	High	Medium	Low	Other GI Projects (TBD)	Total BMP Capacity (acre-ft)
232212	75%	1.55	0.66	--	0.00	--	--	0.06	--	0.05	**0.1**
232312	16%	42.40	27.21	0.23	0.68	--	--	1.44	--	--	**2.4**
232412	23%	146.83	92.11	0.28	2.76	--	0.09	4.72	--	--	**7.8**
232512	46%	0.09	0.02	--	0.00	--	--	--	0.00	0.00	**0.0**
232612	59%	0.99	0.76	--	0.04	--	--	0.01	--	0.03	**0.1**
232912	53%	0.15	0.04	--	0.00	--	--	--	--	0.01	**0.0**
Total	**21.2%**	**192.0**	**120.8**	**0.5**	**3.5**	**--**	**0.1**	**6.2**	**0.0**	**0.1**	**10.4**

Table 5 shows several points of data for each subwatershed as well as the overall total for the City. Using this table, one can determine which subwatersheds will contribute the most toward the City's overall sediment reduction, green street construction, and many other parameters. Table 5's data were calculated assuming the City will pursue the jurisdictional approach.

3.4.2 Countywide Approach

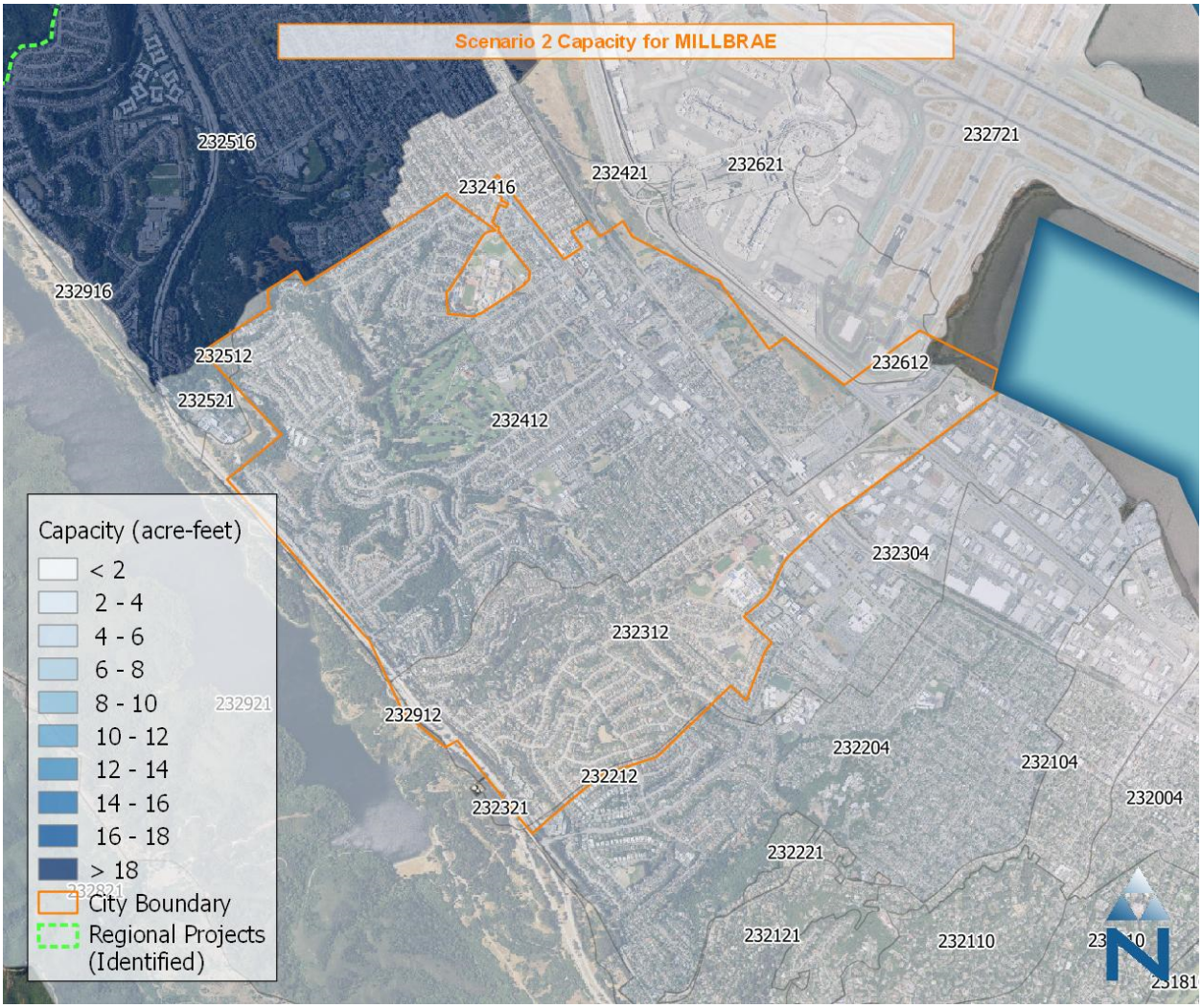


Figure 16. *Scenario 2: Millbrae, sediment reduction goal (countywide).*

The above map (Figure 16) shows the various subwatersheds located within the City, along with the planned structural BMP capacity of each subwatershed area to be utilized within the City under the countywide approach.

Table 6. *Scenario 2, Millbrae: Sediment Reduction Goal (Countywide, with Regional Projects).*

Subwatershed ID	Management Metrics for GI			GI Capacity to Achieve 17.6% Reduction Target (Capacity expressed in units of acre-feet)							
				Existing/Planned			Green Streets				
	% Load Reduction PCBs (Annual)	Annual Volume Managed (acre-ft)	Impervious Area Treated (acres)	Existing Projects	Future New & Redevelopment	Regional Projects (Identified)	High	Medium	Low	Other GI Projects (TBD)	Total BMP Capacity (acre-ft)
232212	21%	0.62	0.40	--	0.00	--	--	0.06	--	--	**0.1**
232312	6%	20.55	12.97	0.23	0.68	--	--	0.48	--	--	**1.4**
232412	3%	23.21	26.04	0.28	2.76	--	0.09	--	--	--	**3.1**
232512	5%	0.01	0.01	--	0.00	--	--	--	0.00	--	**0.0**
232612	59%	0.99	0.76	--	0.04	--	--	0.01	--	0.03	**0.1**
232912	53%	0.15	0.04	--	0.00	--	--	--	--	0.01	**0.0**
Total	**4.4%**	**45.5**	**40.2**	**0.5**	**3.5**	**--**	**0.1**	**0.5**	**0.0**	**0.0**	**4.7**

Table 6 is the same as Table 5, except these data were calculated assuming the City will pursue the countywide approach.

3.4.3 Management Metrics

The RAA presents a "recipe" for GI implementation using various management metrics. Progress towards GI milestones is tracked using one or more of these management metrics.

- **% Load Reduction PCBs (Annual).** This is the load reduction necessary in each subwatershed to achieve the overall targeted load reduction.
- **Annual Volume Managed (acre-ft).** This is the volume of water that is captured, infiltrated, and/or treated within each subwatershed in order to achieve the overall targeted load reduction, given the theoretical combination of projects modeled by the RAA.
- **Impervious Area Treated (acres).** This is the impervious area that needs to be treated in order to achieve the overall targeted load reduction, given the theoretical combination of projects modeled by the RAA.
- **Total Best Management Practices (BMP) Capacity (acre-ft).** Also known as Total Green Infrastructure Capacity, this represents the theoretical capacity of GI projects modeled. Use of this metric as a focus for stormwater improvement goals for the GI Plan is not recommended, due to its sensitivity to the dimensions, locations, and upstream drainage area of the combination of GI projects that are installed.

Actual locations, dimensions, and upstream drainage areas of projects constructed will depend upon site-specific constraints, feasibility, and availability of funding. Therefore, the number of projects constructed

in various subwatersheds may vary significantly from the RAA results, which may affect their effectiveness. Use of management metrics allows the City to alter its "recipe" for GI implementation without needing to re-run the RAA model. This enables the City to adapt to the changing needs and opportunities in its community. **For more information about the City's adaptive management approach to GI implementation, refer to Section 5.6.**

3.4.4 Green Infrastructure Interim Milestones

The MRP requires the reporting of goals for the implementation of GI for interim milestones in 2020 and 2030, in addition to the final goal in 2040. Interim milestones for 2020 and 2030 aimed at reaching the 2040 goal were selected in order to assist municipalities with maintaining a sufficient pace throughout the over 20-year period. In the Countywide scenario, the model found that the installation of green streets in Millbrae was only slightly less effective than green streets installations in other cities. In order to estimate the amount of GI to be implemented by these milestones, various assumptions were made in terms of the pace of implementation for various GI project types.

- **Interim Milestone Assumption for Future New & Redevelopment.** An analysis[19] separate from the RAA determined the projected amount of LID associated with new and redevelopment by 2020, 2030, and 2040. That analysis was completed by Community Design + Architecture, using a C/CAG and MTC demographic dataset. It was found that growth varied significantly between communities and land use types. The data were validated by City staff.
- **Interim Milestone Assumption for Regional Projects.** No regional projects were identified in Millbrae, but in the case of other regional projects in the County, assumptions were made as to when the regional projects modeled would be built and operational. Generally, this was assumed to be by 2030. Regional projects indirectly impact Millbrae because they help to reduce the amount of GI which needs to be installed through other means, such as green streets.
- **Interim Milestone Assumption for Green Streets.** Thirty-three (33) percent of green streets required by 2040 are assumed to be implemented by 2030.

The resulting schedule presented in Figure 17 demonstrates anticipated interim and final milestones for GI implementation in terms of structural capacity. These interim and final GI capacities are subject to adaptive management; however, the 2040 Management Metrics for GI (left side of Table 5, as discussed in **Section 3.4.1**) set the ultimate goal for GI planning efforts and tracking.

In the Countywide scenario, the model found that the installation of green streets in Millbrae was not as cost-effective as in other areas in the County, such that in a Countywide approach, Millbrae would primarily need to implement the GI that is anticipated from the combination of existing projects and future new and redevelopment, with a small additional contribution from green streets.

[19] Community Design + Architecture. (2019).

The City's goal under the jurisdictional approach would be a 21.2% reduction in sediment; under the countywide approach, the City's goal would be a 4.4% reduction. The reason the RAA model calls for a 21.2% reduction rather than a 17.6% reduction as required under the jurisdictional approach is that the model applies potential GI projects in order of efficiency from greatest to least, slowly building the sediment reduction until a particular project causes the sediment reduction to exceed the 17.6% threshold. The City is free to utilize adaptive management strategies **(discussed in section 5.6)** to, for example, construct less efficient but smaller projects to achieve a reduction closer to the 17.6% minimum (or, using the countywide approach, the 4.4% minimum).

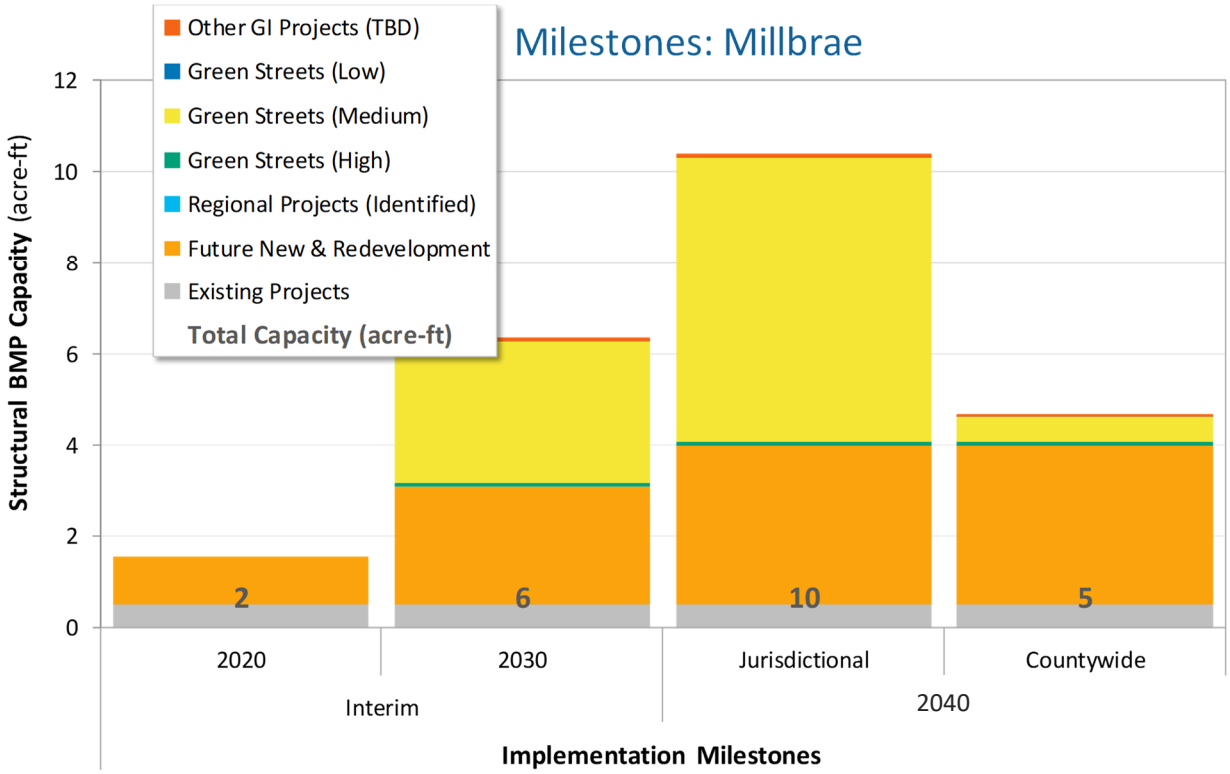


Figure 17. *Summary GI capacity for interim and final implementation milestones.*

Figure 17 displays the City's 2020 and 2030 interim milestones in terms of structural BMP capacity under the jurisdictional approach as well as the 2040 goals under both the jurisdictional and countywide approaches.

Table 7. *Implementation Milestones: Millbrae.*

Implementation Metrics		Implementation Milestones: Millbrae					
		Incremental		Cumulative		Final 2040	
		2020-2030	2030-2040	2020	2030	Jurisdictional	Countywide
Index	% Load Reduction	3.8%	15.6%	1.8%	5.6%	21.2%	4.4%
	Volume Managed (acre-ft/yr)	34.2	139.8	18.0	52.2	192.0	45.5
	Treated Impervious (acres)	12.8	97.1	10.9	23.7	120.8	40.2
Capacities (acre-ft)	Existing Projects	0.0	0.0	0.5	0.5	0.5	0.5
	Future New & Redevelopment	1.6	0.9	1.0	2.6	3.5	3.5
	Regional Projects (Identified)	--	--	--	--	--	--
	Green Streets (High)	--	0.0	--	0.1	0.1	0.1
	Green Streets (Medium)	--	3.2	--	3.1	6.2	0.5
	Green Streets (Low)	--	0.0	--	0.0	0.0	0.0
	Other GI Projects (TBD)	--	0.0	--	0.1	0.1	0.0
	Total	**1.6**	**4.1**	**1.5**	**6.4**	**10.4**	**4.7**

Table 7 displays both the incremental and cumulative growth recommended from 2020 through 2040 to reach the 2040 goals for the jurisdictional approach. The totals required for the countywide approach are also provided. **For a visual depiction of the City's existing GI projects and future GI opportunities, please see the maps in Appendix B.**

4.0 PROJECT IDENTIFICATION AND PRIORITIZATION

4.1 Introduction

Provision C.3.j. of the MRP states that each Permittee shall develop the following:

> *"A mechanism…to prioritize and map areas for potential and planned projects, both public and private, on a drainage-area-specific basis, for implementation over the following time schedules, which are consistent with the timeframes for assessing load reductions specified in Provisions C.11. and C.12 (i) By 2020; (ii) By 2030; and (iii) By 2040.*
>
> *The mechanism shall include criteria for prioritization…and outputs (e.g., maps, project lists) that can be incorporated into the Permittee's long-term planning and capital improvement processes."*

This chapter summarizes the City's project identification and prioritization process, which consists of the following elements:

1. **Identification and Prioritization of Project Opportunities through the San Mateo County Stormwater Resources Plan (SRP).** In addition to identification of projects in the Capital Improvement Program (CIP), the City has integrated the prioritization results of the San Mateo County Stormwater Resource Plan (SRP), which was developed by SMCWPPP with participation from the GI TAC and member agencies. The SRP establishes a region-level, watershed-based planning and implementation guide for stormwater and dry weather runoff capture and reuse projects on publicly-owned land and rights-of-way. The SRP produced a list of prioritized project locations eligible for future State implementation grant funds.
2. **Identification and Prioritization of Project Opportunities through the Capital Improvement Program (CIP).** Starting in 2016 with the adoption of the new MRP, the City prepared a list of projects that have the potential to incorporate Green Infrastructure (GI). This list is updated each year to reflect the project status, additional findings, and new additions to the CIP. The focus of this list is on public projects listed in the CIP rather than private projects, because private projects are typically tracked separately as regulated project opportunities. This chapter formalizes the process developed to promote early implementation of GI projects for the identification and prioritization of project opportunities.
3. **Identification and Prioritization of Project Opportunities on Private Property.** Identification and prioritization of opportunities on private property is not the focus of this chapter, but the City does intend to collaborate where possible with other agencies and private landowners. At the end of this chapter, the City identifies possible partners with whom the City can collaborate to achieve the water quality goals outside the City rights-of-way.

4. **Future Identification and Prioritization of Project Opportunities through the San Mateo County Sustainable Streets Master Plan.** Further prioritization of the City's streets, sidewalks, City-owned properties, and other land resources will be conducted in the future through the San Mateo County Sustainable Streets Master Plan in 2021.

The City is intentionally spring boarding off existing processes in order to (1) maintain consistency with the SRP and BASMAA GI screening process, (2) take advantage of training conducted to familiarize staff with the SRP and screening process, and (3) make the identification and prioritization process simple, so as to spend more time focusing on how to implement GI on projects that have GI potential.

Bioretention area located at Millbrae Estates.

4.2 Identifying Existing Projects and Future Opportunities

4.2.1 Participation in Developing San Mateo Countywide Stormwater Resource Plan

SMCWPPP developed an SRP, which, in addition to characterizing San Mateo County water resources, established both a quantitative prioritization protocol for GI opportunities and an initial list of prioritized local and regional GI projects. It also served the purpose of allowing municipalities access to funding for stormwater and dry weather runoff capture projects. Senate Bill 985, which went into effect on January 1, 2015, requires the development of an SRP as a condition of receiving voter-approved bond funds for stormwater and dry weather runoff capture projects. The final draft of the San Mateo County SRP was approved under Resolution 17-04 by the C/CAG Board of Directors on February 9, 2017.

The SRP is intended to be a living document and will be periodically revised, once every five (5) years, to update the project implementation plan and reflect lessons learned through wide-scale integration of LID, green streets, and regional stormwater capture projects.

The City contributed proposed projects to the SRP during the development of the SRP and may consider opportunities to pursue grant funding for those projects identified as part of the GI Plan Implementation Process.

4.2.2 Identification and Screening of Project Opportunities through the Capital Improvement Program

The City's primary means of identifying and screening project opportunities is the Capital Improvement Program (CIP). Projects that are listed in the CIP are likely to be constructed and operated, as they address specific City needs and provide benefits consistent with City goals, policies, and priorities. Projects are typically added to the CIP based, in part, on needs assessments performed in association with the development of master plans, such as a Parks Master Plan or Storm Drain Master Plan. With the development of this GI Plan, the City is both formalizing and documenting its procedure for screening CIP for GI potential as well as reinforcing the link between GI and the City's various local planning documents and master plans.

As required by the MRP, the City will continue to prepare and maintain a list of projects with potential for inclusion of GI measures that are planned for implementation during the permit term. The City also plans to annually update the map of the City's existing and potential GI projects in Appendix B to reflect current progress towards the GI plan implementation as well as future project opportunities.

Figure 18 summarizes the key factors that are taken into consideration when integrating GI into the CIP.

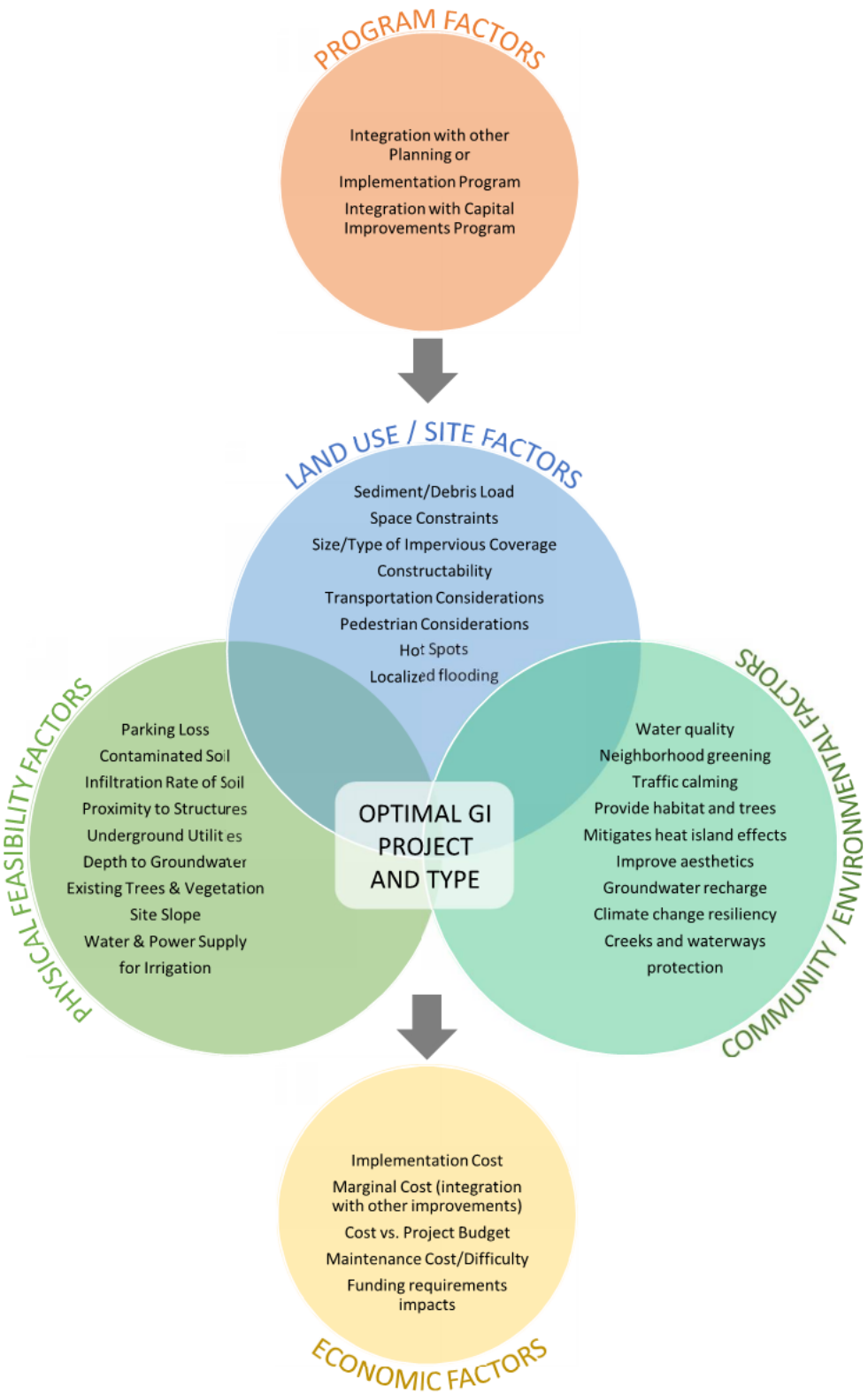


Figure 18. *Factors Impacting Selection of Optimal GI Projects.*[20]

[20] *Green Infrastructure Implementation.* (2014). Adapted from Figure 10.1, Decision process for selection of GI Types. Water Environment Federation.

The City screens its CIP using an adjusted version of the BASMAA GI Screening Process (BASMAA, 2016). This process consists of three parts:

- **Part 1 – Initial Screening.** Projects move on to the Part 2 Screening process unless they are one of the following categories: No Potential, Too Late to Change, Too Early to Assess, or Maintenance / Minor Construction. Projects without GI potential are removed from the City's tracking list.
- **Part 2 – Assessment of GI Potential.** Projects are assessed for their ease of integration of GI according to project types. C.3-Regulated project status is assessed. Projects without GI potential are removed from the City's tracking list, and the reasons for infeasibility of incorporating GI are documented.
- **Part 3 – Preliminary Design.** Information is collected, preliminary GI sizing takes place, barriers and conflicts are assessed, budget and schedule considerations are noted, and the results of the GI assessment are documented. Projects without GI potential are removed from the City's tracking list, and the reasons for infeasibility of incorporating GI are documented.

This screening process is provided in Appendix A.

4.2.3 Identification of Opportunities on Private Property

The GI Plan focuses on public rights-of-way as well as identification and screening of projects that are within the jurisdiction and control of the City. However, GI can be implemented on private property which is under development through the project entitlement process. **For more detail about how the City enforces GI on private property, refer to Section 10.2, "Private Development Program and Policies".**

4.3 Determining GI Priorities

4.3.1 Countywide GI Project Screening

The SRP includes an evaluation of project benefits addressing several key metrics: Water Quality, Water Supply, Flood Management, Environmental, and Community Benefits. Based on these metrics, watershed characteristics, and processes (including land use, impervious cover, hydrologic soil group, percent slope, rainfall, and pollutant wasteload), the SRP identifies and prioritizes projects to address water quality impairment, reduce flooding, and provide more natural groundwater recharge.[21]

Three basic categories of project opportunities have been screened (for more information about these project opportunities, refer to Section 3.3.2, Modeled GI Opportunities):

[21] *Stormwater Resource Plan for San Mateo County.* (2017, February). San Mateo Countywide Water Pollution Prevention Program City/County Association of Governments of San Mateo County. Prepared by Paradigm Environmental and Larry Walker Associates, Inc.

- **Future New and Redevelopment**
- **Regional Projects**
- **Green Streets**

Table 8 summarizes the screening methodology for parcels and rights-of-way.

Table 8. *SRP Parcel and Right-of-Way Project Screening Methodology.*

Screening Factor	Characteristic	Criteria	Reason
PARCEL			
Public Parcels	Ownership	City, County, or Town	Identify all public parcels for regional storm and dry weather runoff capture projects or onsite LID retrofits
	Land Use	Park, School, Other (e.g., Golf Course)	
Suitability	Parcel Size	>0.25 acres	Adequate space for regional stormwater and dry weather runoff capture project
		<0.25 acres	Opportunity for onsite Green Infrastructure retrofit
	Average Parcel Slope	<10%	Steeper grades present additional design challenges
RIGHT-OF-WAY			
Selection	Functional Class	S1200 S1400 S1730 S1780	City street, arterial Local neighborhood road, rural road Alley Parking lot roads
Suitability	Ownership	Public	Potential projects are focused on public and right-of-way opportunities
	Road Slope	<5%	Steep grades present additional design challenges; reduce capture opportunity due to increased runoff velocity

4.3.2 Countywide GI Project Prioritization

After the identification of feasible project locations, screened parcels and rights-of-way were prioritized to aid in the selection of potential project locations that would be most effective and provide the greatest number of benefits.

This was a two-step ranking process:

1. First, all potential project locations were ranked on the basis of which sites offer the greatest opportunity for stormwater capture and other multiple benefits. Opportunities to combine stormwater capture projects with the CIP can be considered now and in the future.
2. The highest-ranked opportunities were further analyzed to provide a detailed quantification of project benefits and develop preliminary conceptual designs and project costs. Though this analysis was focused on a select number of opportunities, the concepts developed can be used on a wide variety of similar projects.

Specifically, projects were prioritized using the following categories, through a quantitative scoring system:

- **Physical Characteristics.** For parcels, physical conditions include land use or, for green streets, street type. Physical characteristics also include impervious area, parcel size, hydrologic soil

group, and/or slope. Prioritization based on these factors varies slightly depending on whether the project was a regional project, green street, or LID retrofit. In general, the highest prioritization is given to sites that consisted of high imperviousness, have the potential to infiltrate, and have mild slopes.

- **Flood-Prone Streams.** Projects placed within the subwatersheds of flood-prone streams and areas subject to flooding can help to mitigate flood risks and reduce flood and hydromodification impacts by limiting the volume of runoff that reaches the impacted streams. Therefore, high priority was given to sites closest to the flood-prone streams.
- **PCB Interest Areas.** PCBs are one of the primary pollutants of concern within the Bay Area; therefore, siting stormwater capture projects in PCB interest areas can potentially address water quality issues.
- **Co-Located Planned Projects.** Consideration of other potential or planned City projects opens opportunities for cost-sharing and maximizes multiple benefits achieved by a single project. Higher priority scores were given to project opportunities that may be implemented in parallel with new and redevelopment projects or other municipal CIP projects. For example, "Safe Routes to School" projects may have opportunities for integration of GI; sometimes this integration allows the project to be eligible for additional grant funding.
- **Drains to TMDL Waters.** Projects that are located in watersheds that drain to Bay TMDL waters were given higher scores. Stormwater capture in these areas will aid in the removal of pollutants from runoff downstream.
- **Multiple Benefits.** While the reduction of pollutant loads is one of the primary objectives of GI, several other benefits can be achieved to improve cost effectiveness and increase buy-in. Potential benefits of GI are listed in Section 1.1.4.

Through the City staff's and SMCWPPP's input, the prioritization criteria were weighted to arrive at the final project prioritization methodology. The process resulted in assigned prioritization scores for each identified GI opportunity within each of the three project categories (green streets, LID retrofits, and regional projects). These scores could later be further filtered or sorted to support ongoing prioritization of projects within the City of Millbrae. The criteria and weighting are summarized for each project type in Table 9.

Table 9. *SRP Parcel and Right-of-Way Project Prioritization Methodology.*

Metric	Points						Weight Factor
	0	1	2	3	4	5	
REGIONAL PROJECTS							
Parcel Land Use			Schools/Golf Courses	Public Buildings	Parking Lot	Park / Open Space	
Parcel Size (acres)	0.25 ≤ X < 0.5	0.5 ≤ X < 1	1 ≤ X < 2	2 ≤ X < 3	3 ≤ X < 4	4 ≤ X	
Slope (%)	5 < X ≤ 10	4 < X ≤ 5	3 < X ≤ 4	2 < X ≤ 3	1 < X ≤ 2	0 < X ≤ 1	
LID RETROFIT PROJECTS							
Parcel Land Use			Schools/Golf Courses	Park / Open Space	Parking Lot	Public Buildings	
Slope (%)	5 < X ≤ 10	4 < X ≤ 5	3 < X ≤ 4	2 < X ≤ 3	1 < X ≤ 2	0 < X ≤ 1	
GREEN STREET PROJECTS							
Parcel Land Use	Highway		Arterial	Collector	Alley	Local	
"Safe Routes to School" program	No					Yes	2
Slope (%)		4 < X ≤ 5	3 < X ≤ 4	2 < X ≤ 3	1 < X ≤ 2	0 < X ≤ 1	
ALL PROJECTS							
Impervious Area (%)	X < 40	40 ≤ X < 50	50 ≤ X < 60	60 ≤ X < 70	70 ≤ X < 80	80 ≤ X < 100	
Hydrologic Soil Group		D	Unknown	C	B	A	
Proximity to Flood-prone Channels (miles)	Not in sub-basin	3 < X		1 < X ≤ 3		X ≤ 1	2
Contains PCB Risk Areas	None			Moderate		High	2
Currently planned by City or co-located with other City project	No					Yes	2
Drains to TMDL water	No					Yes	
Above groundwater basin	No		Yes				
Augments Water Supply	No	Yes					
Water Quality Source Control	No	Yes					
Reestablishes Natural Hydrology	No	Yes					
Creates or Enhances Habitat	No	Yes					
Community Enhancement	No	Yes					

The results of the SRP project prioritization are provided in a webviewer created by C/CAG: http://54.183.214.51/maps/SMC_project_prioritization. **Prioritization maps for the City of Millbrae are provided in Appendix B.**

4.4 Potential Collaborations with Outside Agencies

The City may seek collaboration opportunities with outside agencies which fall within the City's limits but are in non-jurisdictional areas (areas not subject to the MRP under the City's MS4 permit). These include the following:

Public School Districts

There are two (2) public school districts within the City of Millbrae and five (5) public schools (as of Fall 2019), as listed in Table 10.

Table 10. *Millbrae Public Schools.*

Public School Districts	Public Schools
Millbrae School District	**Elementary Schools**
San Mateo Union High School District	Green Hills School
	Meadows School
	Spring Valley School
	Middle Schools
	Taylor Middle School
	High Schools
	Mills High School

The City does not have jurisdiction or planning and building authority over public school properties. As of early 2019, stormwater discharges from K-12 School Districts and Community College Districts are regulated through the Phase II Small Municipal Separate Storm Sewer System (MS4) Program[22] (Phase II Permit). State Universities were already covered under the Phase II Permit. The Phase II permit does not require the development of a GI Plan but does require the incorporation of GI measures through the Post Construction Storm Water Management Program (Provision E.12 of the Phase II Permit). Prior to 2019, school districts were not required to construct stormwater treatment measures, except in some municipalities (for example, as a required mitigation measure under a Coastal Development Permit).

Other Possible Agency Partners

- San Mateo County
- Caltrans
- Bay Area Rapid Transit (BART) – Millbrae Station
- SamTrans – Bus Routes SFO and 397
- San Francisco Public Utiliteis Commission (SFPUC)

[22] As of the writing of this section, the amended Small MS4 General Permit was adopted by the State Water Board on December 19th, 2018, but is not yet certified by the State Water Board clerk.

5.0 PROJECT TRACKING

5.1 Introduction

Provision C.3.j of the MRP states that each Permittee shall develop the following:

> *"A process for tracking and mapping completed projects, public and private, and making the information publicly available."*

Tracking and mapping both existing and potential GI projects facilitates the implementation of a Green Infrastructure (GI) program in several ways:

1. Keeps the community engaged by providing an ongoing list of existing and potential GI projects.
2. Facilitates management of and associated inspections for a GI Operations and Maintenance Program.
3. Keeps the focus on potential GI projects in the City, to encourage a continued effort to transition the City from "gray" to "green", and ensure these projects continue to make progress.
4. Allows the City to ascertain the treatment area for potential GI projects and continue to refine this area as projects develop.
5. Enables tracking of projects in different areas of the City, which may have different land uses and priorities.
6. Helps measures progress towards water quality objectives.

5.2 City Internal Project Tracking System

As part of the development of the GI Plan, the Town mapped all existing and potential areas treated by GI in a Geographic Information System (GIS), which is a graphical framework for gathering, analyzing, managing, and representing data. In addition, projects are tracked on an internal local server database, which includes additional data, such as the type of treatment measures installed. The local server database is updated on a continuous basis and is also used to manage the Town's GI Operations and Maintenance program.

GIS-based tracking of GI projects allows the City to integrate information from other City assets and programs. For example, mapping the John Daly Streetscape Project in GIS not only helps the City eventually calculate progress towards GI milestones, but also helps clarify project information for inspectors, such as the types of GI measures installed and the project limits. The City can use GIS to visualize, quantify, and prioritize potential GI projects, then select those which offer multiple project benefits or are ideally suited to GI implementation, such as synchronicity with the bicycle and pedestrian plan, mitigation of flooding, and proximity to storm drain systems.

The City will aim to update the GIS exhibit which maps existing and potential areas treated by GI (**refer to the last exhibit of Appendix B**) on an annual basis and prior to preparation of the Annual Report to reflect the following:

1. Projects which moved from "potential" to "existing" (i.e., were constructed).
2. Development projects that come in for planning review (either entitled, or in pre-application status if the project is likely to be submitted as a formal application).
3. CIP Projects which are newly-identified as having GI potential.

The City's internal tracking system is intended to be used until the Countywide Project Tracking System becomes available. At that time (estimated 2021), the City may consider reassessing the need for an additional internal project tracking tool. So as not to duplicate efforts, the City may consider the following options:

- Retire the internal project tracking system and use the Countywide tool instead. This will save on upfront costs and could even save on future costs if the City has a small number of GI projects.
- Should the City determine that, in addition to the Countywide tool, a more robust internal tracking tool with greater functionality is needed, the City may transition the Excel spreadsheet and GIS layer into a stormwater compliance database, which would require significant upfront expense but could reduce future costs if the City has enough existing GI projects. This would allow City staff to complete the following:
    - Complete inspection reports electronically.
    - Match the inspection data more quickly to the project list.
    - Facilitate the exporting of data.

5.3 City Public-Facing Project Tracking System

As part of the development of the GI Plan, the City created a GI Map using the ArcGIS Online story map tool. This map features selected existing and potential GI projects within the City. This story map is an interactive, publicly-accessible web map that can be accessed at https://arcg.is/0KbjDm. This allows the public to see locations, descriptions, and photos of existing GI throughout the City. (for screenshots, see Figure 19).

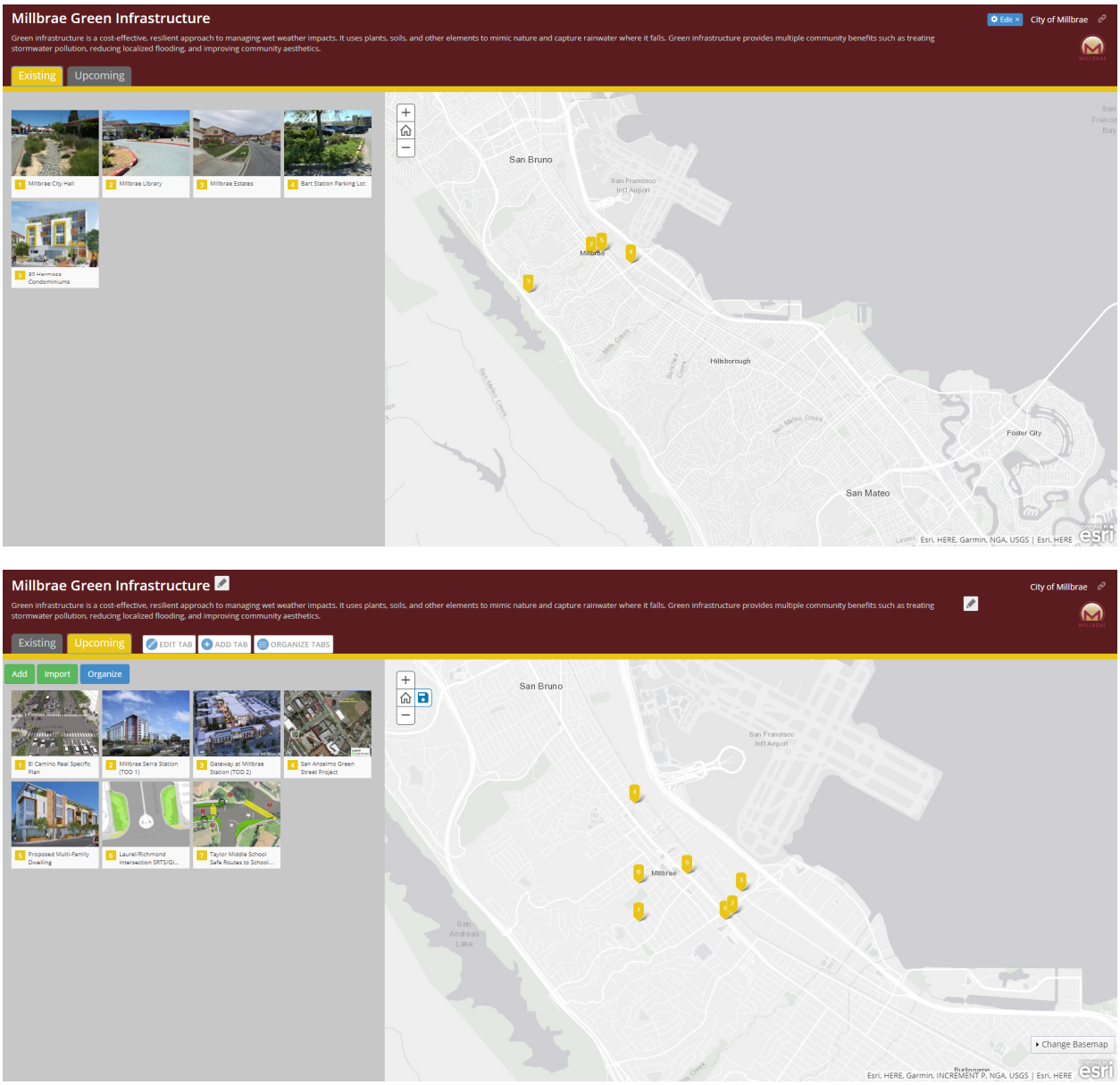


Figure 19. *Screenshots of the City's GI Map (2019).*

5.4 O&M Tracking Systems and Procedures

Proper maintenance is essential to maximizing the environmental, social, and economic benefits of GI, as well as ensuring that projects perform as expected. Written plans and procedures ensure proper long-term maintenance and are critical components to the success of any GI measure.

The City's goal is to ensure that public, private, Regulated, and Non-Regulated GI measures are maintained sufficiently to perform as designed by implementing the City's Enforcement Response Plan (ERP) and Standard Operating Procedures (SOPs), and by drawing from SMCWPPP resources, such as Chapter 6, Guidelines and Specifications.

5.4.1 O&M Tracking of Provision C.3.h. ("Regulated") Sites

The MRP requires, under Provision C.3.h, that GI installed as part of C.3 Regulated Projects as well as permeable pavement installations in excess of 3,000 square feet be inspected upon project completion and at least once every five (5) years. Inspection and enforcement procedures are described in the City's Stormwater NPDES Enforcement Response Plan (ERP).

The City maintains an electronic database of sites as required by Provision C.3.h, which includes project data, the contact information of the site representative, the site Operations and Maintenance (O&M) Agreement and Plan, past inspection records, and records of any enforcement actions.

5.4.2 O&M Tracking of Non-Regulated Sites

The City will continue to design, construct, and maintain GI on public properties and rights-of-way. Non-Regulated Project installations of GI are tracked as feasible in the same manner as C.3 Regulated projects, except that small measures, such as those installed on single-family homes, will not necessarily be tracked for the purposes of the GI milestones. The City may later opt to track these small projects.

5.5 Countywide Project Tracking Tool

The City/County Association of Governments of San Mateo County (C/CAG) received a Caltrans Adaptation Planning Grant, which is being used to partially fund the Sustainable Streets Master Plan (SSMP). The SSMP and associated deliverables will support C/CAG's member agencies in advancing sustainable stormwater management and creating more resilient transportation networks in San Mateo County in the face of a changing climate.[23]

The SSMP will include the following elements:

- **Community Engagement.** Input will be solicited from local agency staff, community stakeholders, and the public to provide a participatory forum for sharing progress and soliciting input on the Master Plan.
- **Climate Adaptation Risk Analysis on Local Transportation Network.** Climate change-related precipitation impacts and stormwater capture benefits will be quantified.
- **High Resolution Data Analysis and Fine-Scale Drainage Delineation.** Data will be collected from member agencies, and then a high-resolution drainage system delineation will be prepared. Sustainable streets opportunities within the public right-of-way will be identified at a street-level scale.

[23] Request for Proposals for Technical Support to the City/County Association of Governments of San Mateo County to Develop the San Mateo Countywide Sustainable Streets Master Plan. (2018, August 30).

- **Prioritization of Sustainable Streets Opportunities.** The SSMP will build on the existing green street prioritization system that C/CAG developed as part of the SRP by integrating priorities associated with protecting the multi-modal transportation network, pavement maintenance, and bicycle/pedestrian planning. The prioritization will also be subject to a rigorous stakeholder involvement process.
- **Project Concepts.** Up to ten (10) priority pilot projects will be identified and detailed which demonstrate the integration of bicycle and pedestrian improvements with sustainable streets practices.
- **Web-based Sustainable Streets Project Implementation Mapping and Tracking Tool.** An online tracking tool will be developed which can be used by member agencies to track GI implementation. It will include dashboards to show the public and interested stakeholders progress toward building adaptation to precipitation-based climate change impacts as well as water quality improvement. This tool will be publicly available and will allow users to see locations of implemented projects, project benefits, and progress toward long-term goals.

5.6 Adaptive Management

This GI Plan is intended to act as a "living" document, allowing it to shift and adapt to the changing needs of the City. Using an adaptive management process **(as discussed in Section 3.2.3),** the City will continue to verify feasible opportunities for GI projects to meet the final load reduction goals for 2040. The process will include the tracking of management metrics as discussed in Chapter 3, and continued re-evaluation of GI project opportunities. Aspects of the GI program are outside of the City's control—namely, that the development climate is uncertain, and projects that are anticipated to be constructed through future new and redevelopment may not actually come to fruition. Forecasts for development may be higher or lower than what is achieved by the 2040 milestone. If less development occurs over time, more green streets or regional projects on public land may be needed to provide equivalent volume management. Similarly, there are uncertainties in the implementation of public GI—opportunities and funding for GI are likely to change between now and 2040.

There is also a possibility that the screening and prioritization procedure used to develop the SRP is not as restrictive as it needs to be, meaning that there may be many streets identified as having GI potential where incorporation of GI is not actually feasible. Under such a scenario, additional GI measures may be required to be installed in fewer areas. Alternatively, there may be opportunities not identified through the SRP, but through the CIP, which could result in GI implementation.

By taking an adaptive management approach to GI, the City can establish a process that is both driven by the goals set forth in the RAA, but that is also flexible, iterative, and allows for continuous improvement. GI is goal-driven, and its effectiveness is measured at a watershed scale. Figure 20 represents the adaptive management process.

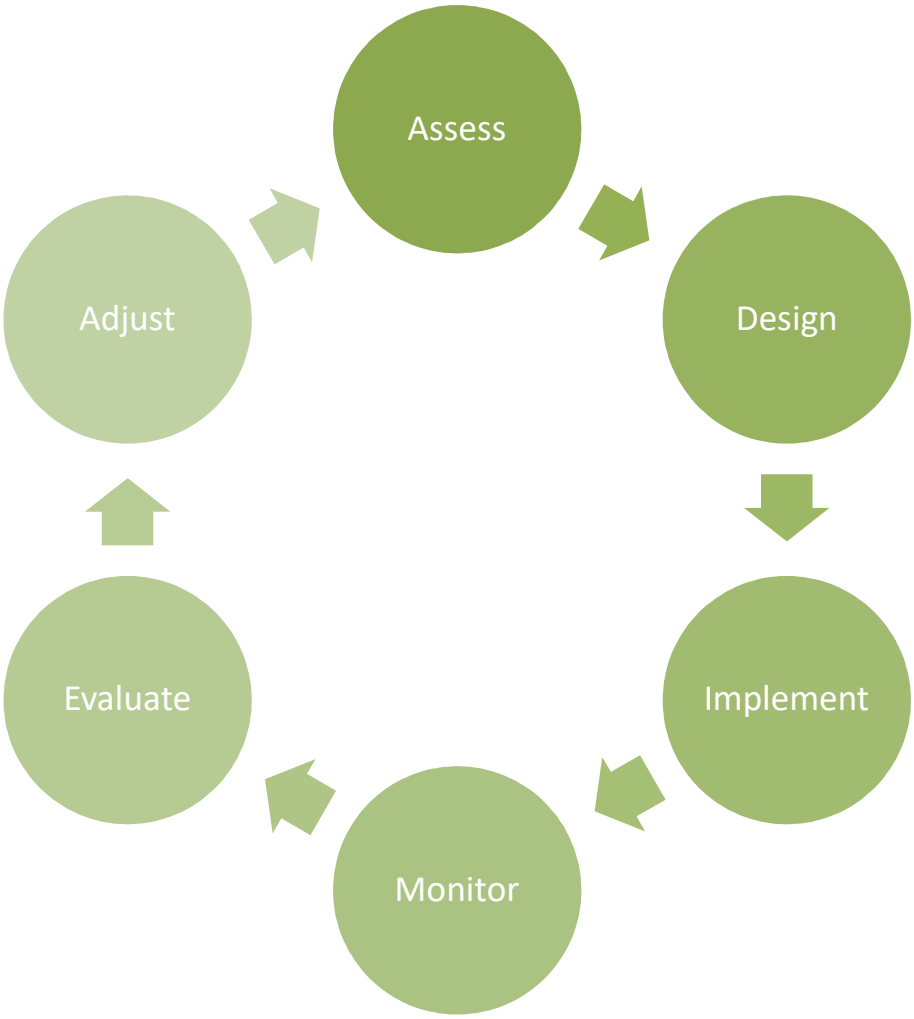


Figure 20. *Adaptive Management Process.*[24]

[24] *Green Infrastructure Implementation.* (2014). Water Environment Federation. Page 220.

6.0 GUIDELINES AND SPECIFICATIONS

6.1 Introduction

The MRP states that the adopted Green Infrastructure (GI) Plan shall contain the following elements:

> *Provision C.3.j.i.(2)(e): "General guidelines for overall streetscape, and project design and construction so that projects have a unified, complete design that implements the range of functions associated with the projects…. The guidelines should call for the Permittee to coordinate, for example, street improvement projects so that related improvements are constructed simultaneously to minimize conflicts that may impact green infrastructure."*
>
> *Provision C.3.j.i.(2)(f): "Standard specifications and, as appropriate, typical design details and related information necessary for the Permittee to incorporate green infrastructure into projects in its jurisdiction."*
>
> *Provision C.3.j.i.(2)(g): "Requirement(s) that the projects be designed to meet the treatment and hydromodification management sizing requirements in Provisions C.3.c. and C.3.d. For street projects not subject to Provision C.3.b.ii (i.e., non-Regulated Projects) Permittees may collectively propose a single approach with their Green Infrastructure Plans for how to proceed should project constraints preclude fully meeting the C.3.d. sizing requirements. The single approach can include different options to address specific issues or scenarios. That is, the approach shall identify different constraints that would preclude meeting the sizing requirements and the design approach(es) to take in that situation. The approach should also consider whether a broad effort to incorporate hydromodification controls into green infrastructure, even where not otherwise required, could significantly improve creek health and whether such implementation may be appropriate, plus all other information as appropriate (e.g., how to account for load reduction for the PCBs or mercury TMDLs)."*

The City has met these requirements through (1) development through the GI TAC and adoption of Countywide GI Guidelines and Standards, which include typical design details and sample specifications; (2) clarification of sizing of Non-Regulated GI projects; and (3) development through the GI TAC and adoption of BASMAA alternative sizing criteria for Non-Regulated green street projects.

6.2 Countywide GI Guidelines and Standards

6.2.1 San Mateo County GreenSuite

The City participated in the GI Technical Advisory Committee (GI TAC)'s development of the "GreenSuite". The GreenSuite is a combination of an updated version of the SMCWPPP C.3 Stormwater Technical Guidance Manual *(C.3 Regulated Projects Guide)* and the newly-developed GI Design Guide (*Design Guide*). The key content and organization of these guides is summarized in Figure 21.

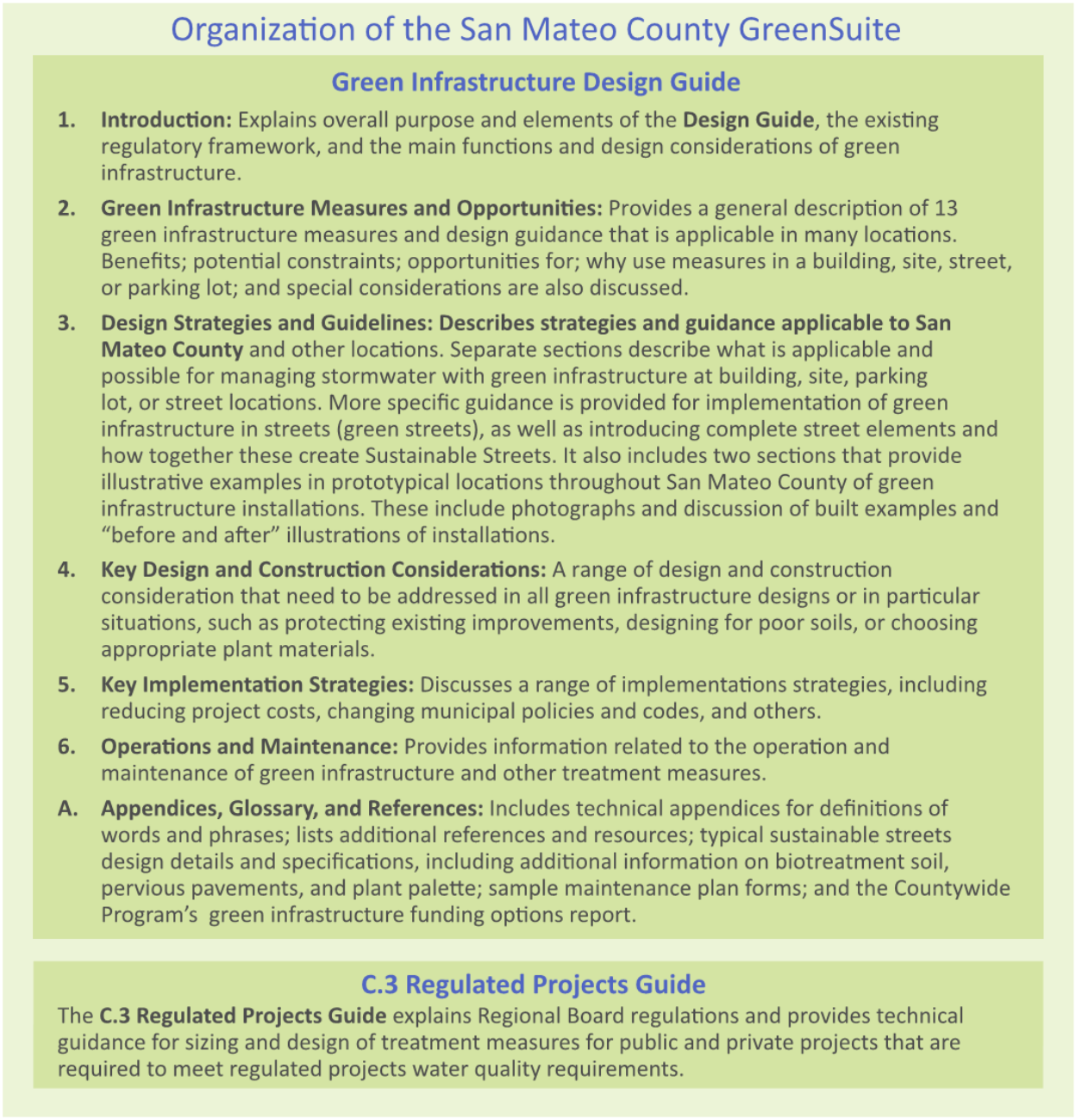


Figure 21. *Key Content and Organization of the San Mateo County GreenSuite.*[25]

Together, these documents allow designers, City staff, and developers to implement a range of GI measures and strategies. They also include model procedures for coordinated and consistent plan review of private projects, scoping and design for public projects, as well as recommendations for ongoing operations and maintenance.

[25] *San Mateo County Green Infrastructure Design Guide.* (2019b). SMCWPPP. https://www.flowstobay.org/gidesignguide.

In order to design GI facilities, designers would likely use a combination of both the *C.3 Regulated Projects Guide* and the *Design Guide.* C.3 Regulated Projects must adhere to the specific requirements of the MRP, but Non-Regulated projects may also benefit from the sizing guidance provided in the *C.3 Regulated Projects Guide.* Designers will find more GI options in the *Design Guide* for Non-C.3 Regulated Projects, because the *C.3 Regulated Projects Guide* does not cover certain measures like green gutters, green walls, stormwater trees, and vegetated swales. If a designer finds that landscape-based measures are not feasible on a project, they might consider mechanical treatment devices, such as media filters or high-flow rate tree wells, which are described in the *C.3 Regulated Projects Guide.* Utilizing both guides allows for flexibility in GI design and implementation on Non-C.3 Regulated projects without repeating information already provided for C.3 Regulated Projects, while keeping the requirements for C.3 Regulated Projects clear and separate.

6.2.2 Green Infrastructure Design Guide

SMCWPPP, with input and feedback from its member agencies, including the City of Millbrae, has developed a countywide Green Infrastructure Design Guide (*Design Guide*) and its appendices to provide comprehensive guidance on the planning, design, construction, and operations and maintenance of GI for buildings, parking lots, sites, and streets. The *Design Guide* addresses the requirements of the MRP, fulfilling Section C.3.j.i.(2)(e) requiring design and construction guidelines for streets and projects and C.3.j.i.(2)(f) for developing typical design details and specifications for different street and project types. The *Design Guide* also addresses the part of C.3.j.i.(2)(g) related to a regional approach for alternative hydraulic sizing for Non-Regulated constrained street projects.

The *Design Guide* includes a range of information related to GI, such as provision of policies and definitions; identification of different types of treatment and site design measures; summation of various benefits including a range of community benefits provided beyond stormwater management; presentation of "before" and "after" images of integrating GI into projects; introduction of complete streets concepts and design; discussion regarding BASMAA's regional approach for alternative sizing for Non-Regulated constrained green street projects; design and implementation considerations; operations and maintenance; and provision of typical construction details and specifications. The *Design Guide* explains how these concepts, considerations, and guidance can be used to effectively integrate GI into new and redevelopment projects, whether C.3 Regulated or not.

General guidelines for overall streetscape and project design, construction, and maintenance have been developed so that projects have unified, thoughtful designs and implement the full range of GI capabilities possible. The MRP emphasizes the need for guidance related to green streets functions, and the *Design Guide* includes implementation guidance specifically for stormwater management and treatment within streets. The guidance supports safe and effective multimodal travel with a focus on the comfort of people walking and cycling; shared use as public space and an attractive and functional public realm; use of appropriate measures for different street and land use contexts and types; and the achievement of urban forestry goals and benefits. The Design Guide describes practices for incorporating GI following the

principle of "no missed opportunities" as specified in the MRP, Provision C.3.j, and for directing the efficient and effective coordination, review, and implementation of GI in public and private projects.

The Appendices of the *Design Guide* include typical design details and specifications for the design and construction of GI applicable to a variety of applications whether street or site-based projects. These details, as well as those provided in the *C.3 Regulated Projects Guide,* can be adapted for use on local GI projects.

6.2.3 Adoption of Countywide GI Guidelines

The City of Millbrae will use the *Design Guide*, *C.3 Regulated Projects Guide,* and future amended versions to provide support and guidance in implementing GI within the City. As more GI projects are implemented in Millbrae, portions of the Design Guide may be superseded by Millbrae-specific updates or modifications based upon lessons learned and other factors experienced in or determined by the City.

The *Design Guide* can be found at SMCWPPP's website at https://www.flowstobay.org/gidesignguide.

C.3 Regulated Projects Guide (formerly known as the *C.3 Technical Guidance)* can be found on the SMCWPPP "Flows to Bay" website at https://www.flowstobay.org/newdevelopment.

For any project identified as having GI potential, a feasibility review will be undertaken to determine the GI options best suited to that project, given its goals, funding source, budget, and constraints. As any such project is developed through concept and plans—including improvement plans—the plans, specifications, details, and project constraints will be reviewed by City Public Works staff for compliance with both the Countywide GreenSuite and City standards. Inconsistencies, if they arise, will be resolved through development of site-specific specifications and details.

6.3 Local Green Infrastructure Guidelines in Millbrae

GI installed within the City of Millbrae will not be planted, whenever possible, with invasive species as identified and ranked by the California Invasive Pest Council (CalIPC). Instead, the City will prioritize the use of non-invasive, California-native species which are suitable to a Mediterranean climate and dry summers. Bay-Friendly Landscaping methods will be applied during both plant selection and plant maintenance. **More guidance about planting in GI facilities is provided in Section 4.11 and Appendix 4 of the *GI Design Guide,* and Appendix A of the *C.3 Regulated Projects Guide.***

6.4 Green Infrastructure Measure Sizing Approaches

6.4.1 Standard "C.3.d" Sizing

MRP Provision C.3 Regulated Projects will continue to be subject to the treatment and hydromodification sizing requirements of Provision C.3.c and C.3.d. The definition of a "Regulated" project and details of various treatment sizing options are described in the MRP and the SMCWPPP C.3 Stormwater Technical Guidance Manual.

The MRP requires that GI projects be "designed to meet the treatment and hydromodification sizing requirements in Provisions C.3.c. and C.3.d." (Provision C.3.j.i.(2)(g)). This means that, for most projects, there will be no difference in the sizing requirements between a Regulated and Non-Regulated Project. As a goal, the City will aim to meet the requirements of Provision C.3.d when sizing GI facilities. However, should site constraints preclude fully meeting these requirements, the City will construct a smaller facility **(for green streets projects, refer to Section 6.4.3, "Alternative Sizing Approach", which describes the BASMSAA Alternative Sizing Criteria)**. In designing GI facilities, the City will pursue a flexible, adaptive approach. In other words, even if a small facility is constructed with a proposed project, smaller facilities still provide measurable stormwater treatment, and future facilities can be constructed to provide stormwater treatment for areas not addressed by the initial installation. Where feasible, bioretention facilities can be designed as "off-line" facilities, meaning they would treat a fraction of runoff generated, preventing high-volume flows and/or bypassing some of the runoff to be treated downstream.

Non-Regulated GI projects may use the full range of stormwater treatment measures described in both the *C.3 Regulated Projects Guide* and *Design Guide*, including mechanical treatment measures such as tree well filters and media filters, without the restrictions imposed on C.3 Regulated Projects. The *C.3 Regulated Projects Guide* summarizes the technical aspects of GI measures, including how they should be sized for treatment. The *Design Guide* introduces some GI measures which are not discussed in the *C.3 Regulated Projects Guide*. For these, it is not clear how to size the GI measures for treatment.

Measures which are not considered treatment for C.3 Regulated Projects (and therefore have no associated sizing criteria for Non-C.3 Regulated Projects) are as follows:

- Vegetated Swale
- Green Gutter
- Green Wall

Two (2) of these measures (vegetated swale and green gutter) can optionally be constructed with the same cross section as a stormwater planter (18 inches of bioretention soil, and 12 inches of Class 2 Permeable Material). If these measures are built to the same standards as a stormwater planter under the GreenSuite, the same sizing factors as those that apply to stormwater planters would apply. Otherwise, a customized sizing approach would need to be proposed by the designer and verified by the City, with appropriate factors of safety applied.

For green walls, there is no like-measure with established sizing criteria. Therefore, when designing green walls, no minimum sizing criteria pertain, and, as such, green walls can be constructed to fit the site-specific context and available wall space.

GI not only improves the quality of stormwater runoff, but also provides physical and mental health benefits for the community through urban greening and neighborhood beautification.

6.4.2 Defining Drainage Management Areas

C.3 Regulated Projects must be sized to provide treatment for the effective impervious area which drains to them. For more information about defining catchment areas for projects, refer to the *C.3 Regulated Projects Guide* and Chapter 4 of the *Design Guide*.

Non-Regulated public street applications of GI measures must also be sized to provide treatment for the effective impervious which drains to them, with an exception: they need not be designed to treat contributing private areas, such that the drainage management area (also called "catchment area") is limited to the street right-of-way, or in some cases, the back of sidewalk. If the sidewalk drains to a planter strip, the drainage management area can be limited to the back of curb, since the sidewalk is "treated" by the landscaped planter strip. This approach was first established in the 2009 San Mateo County Sustainable Green Streets and Parking Lots Guidebook (refer to Chapter 5) and has been deemed acceptable for the purposes of sizing projects for the 2018 C/CAG Safe Routes to School (SRTS) and Green Streets Infrastructure Pilot Program. Sizing for public street applications is not discussed in the GreenSuite.

6.4.3 Alternative Sizing Approach

6.4.3.1 Alternative Approach Description (MRP C.3.j.2.g)

All GI projects should be designed to meet the treatment requirements of Provisions C.3.c and C.3.d of the MRP (and hydromodification requirements, where applicable). However, an alternative regional sizing approach was developed for street projects where site constraints preclude fully meeting the sizing requirements of Provision C.3.d.

BASMAA was tasked with developing Alternative Sizing Criteria on a regional basis. Per the MRP, GI facilities must be sized using either a flow, volume, or combination flow and volume method, depending on the type of treatment measure used and based on the engineering judgment of the project designer. The least conservative method is the combination flow and volume method, which specifies that treatment facilities should be sized to treat at least 80 percent of the total runoff over the life of the project, using local rainfall data. Using the combination flow and volume method and a continuous simulation analysis, BASMAA's consultant, Dubin Environmental Consulting, assessed what sizing factors are needed—assuming a standard bioretention area cross section—to achieve the MRP sizing requirements. It was determined that bioretention facilities with a standard cross section can both capture and treat the required amount of Provision C.3.d runoff when sized to 1.5% – 3% of the tributary equivalent impervious area, depending on the project location.

Hydromodification management control requirements were also assessed. Dubin Environmental Consulting determined that a standard bioretention facility sized to 4% of the tributary equivalent impervious area, having a 6-inch deep surface storage layer, 2-inches of freeboard, 18 inches of bioretention soil, and 12-inch deep gravel storage layer would meet the hydromodification standard at any location in the Bay Area.

6.4.3.2 Conditions Under Which the Alternative Approach May Be Used

The BASMAA Alternative Sizing Criteria (BASMAA, 2018) can be used when site constraints are present which preclude fully meeting the sizing criteria.

Where feasible, bioretention facilities on street projects should be sized as large as possible. There are several reasons to design and build facilities larger than the Provision C.3.d minimum:

- Promotes better performance.
- Ensures compliance with Provision C.3.d despite minor flaws in design, construction, or maintenance.
- Allows for an engineering safety factor.
- Maximizes removal of pollutants.
- Allows the facilities to operate as full trash capture devices.
- Facilitates management of hydromodification effects, as relevant.

However, existing streetscapes can be challenging to retrofit, making it difficult to build large GI facilities. These constraints include the following:

- Limited project funding.
- Larger facilities can result in more parking loss and more impacts to residential driveways.
- The presence of existing underground utilities can create restrictions in either the footprint or depth of a GI facility. Typically, clearances are required by the utility owner between the existing utility, the GI facility, and any associated storm drain piping. In addition, having utilities in the GI facility can create issues in the future, as a utility owner must be careful not to destroy the GI facility or impair its function when performing repairs on their utility lines. Utility crews are typically not familiar with the construction requirements or functionality of GI facilities.
- The presence of existing or proposed above-ground structures and fixtures such as streetlights, fire hydrants, and utility boxes can reduce the amount of functional cross-sectional area of the GI facility.
- Larger bioretention facilities are likely to impact existing mature trees and root systems. It may be preferable to reduce the treatment area in order to preserve a tree, especially given that mature trees offer many stormwater quality benefits.
- Sometimes, the elevations of nearby storm drain facilities or the lack of storm drain facilities put restrictions on either the depth or use of an underdrain facility or overflow structure.
- It is difficult to define and control catchment areas for street projects, because both public areas (streets, curbs, and sidewalks) and private areas (residential or commercial areas, some of which may be treated by onsite facilities) drain to the bioretention areas. Typically, it would make the project infeasible to aim to treat the entirety of public and private runoff.
- The in-situ soil permeability and strength is often low. Protection of the adjacent roadway structure (e.g., via deep retaining curbs) is often necessary to prevent compromising the roadway by oversaturation. This can increase project costs.
- In some cases, it may be preferable to limit the depth of the facility adjacent to the roadway or sidewalk, or to introduce 3:1 side slopes to promote safety. These modifications for safety can reduce the effective area of the treatment measure.
- Right-of-way is highly limited, and the City must always consider the site context and various City objectives when designing a project. Truck turning radii, the presence of bike lanes and pedestrian walkways, parking loss, through-lane widths, and driveway impacts are all considerations when designing GI facilities on a public street.

7.0 INTEGRATION WITH OTHER PLANNING DOCUMENTS

7.1 Introduction

To ensure implementation of the GI Plan, the MRP states that the Green Infrastructure (GI) Plan shall contain the following:

> *C.3.j.i.(2)(h): "A summary of the planning documents the Permittee has updated or otherwise modified to appropriately incorporate GI requirements, such as: General Plans, Specific Plans, Compete Street Plans, Active Transportation Plans, Storm Drain Master Plans, Pavement Work Plans, Urban Forestry Plans, Flood Control or Flood Management Plans, and other plans that may affect the future alignment, configuration, or design of impervious surfaces within the Permittee's jurisdiction, including, but not limited to, streets, alleys, parking lots, sidewalks, plazas, roofs, and drainage infrastructure. Permittees are expected to complete these modifications as a part of completing the GI Plan, and by not later than the end of the permit term."*
>
> *C.3.j.i.(2)(h): "To the extent not addressed above, a work plan identifying how the Permittee will ensure that GI and low impact development measures are appropriately included in future plans (e.g., new or amended versions of the kinds of plans listed above)."*

7.2 Evaluation of Planning Documents

The City undertook a review of its existing planning documents to determine if the documents (1) contained opportunities for GI implementation; (2) have existing language and policies supporting GI implementation; and (3) hold potential for updates to further implement GI. The planning documents were then organized into the following categories:

- Planning documents that do not require modification or are unrelated to GI;
- Existing planning documents which support GI implementation;
- Modifications made to existing planning documents; and
- Planning documents to be updated in the future.

Planning documents unrelated to GI are not included in the GI Plan.

The City presents the key planning documents which include language that support or relate to GI implementation in section 7.3. Planning documents to be updated are discussed in section 7.4.

7.3 Existing Planning Documents Which Support GI Implementation

The implementation of GI is addressed in many of the City's existing planning documents' policies, goals, and objectives. Because of the multiple benefits that can be achieved through GI, the City can implement GI as a strategy for flood reduction, climate change adaptation, traffic calming, and other City goals. Table

11 summarizes the City's existing documents and the method by which each document supports GI implementation.

Table 11. *Existing planning documents which support GI implementation.*

Planning Document	Related Sections and Pages
Hazard Mitigation Plan (Annex) 2015	Section 12.2: Comment 12 Table 12-1: Stormwater Management Table 12-1: Stormwater Plan 12.4.1 - Opportunities for Future Integration
The City of Millbrae Hazard Mitigation Plan addresses local hazards, which includes flood hazard mitigation and stormwater management. The Plan highlights the Stormwater Management ordinances as legal mechanisms to support flood hazard mitigation. GI can be used as a strategy to improve water quality and filter pollutants out of stormwater runoff while providing additional capacity for flood hazard mitigation.	
Storm Drain Master Plan 2018	p. 1-1: Introduction, Project Purpose and Goals p. 1-3: Project Purpose and Goals p. 3-8: 3.3 GIS Database p. 4-5: 4.7.1-4.7.2 Recommended Performance/Design Criteria p. 6-1: Recommended Stormwater Conveyance Improvements p. 7-1: Conclusion and Recommendations
The City's Storm Drain Master Plan describes and evaluates the City's existing storm drain system. The plan references the adopted GI Workplan and specifically notes that GI is an important consideration throughout the planning and implementation process. In addition, GI is included in the Performance and Design Criteria.	
Parks and Facilities Inventory 2018	p. 3-9) Funding and Financing for the Parks Division and Recreation Department: mentions streetscape projects and other landscape projects. p. 5-6) Inventory Evaluation. p. 6-5) Urban Landscape Section & Urban Forest Section. p. 6-8) Opportunities and Constraints p. 6-14) Urban Landscape and Forest. p. 6-15) Accessible Parks Recommendations (09: traffic calming and street narrowing) p. 6-17) Maintenance and Operations Recommendations p. 6-20) Bayside Manor Park: Potential improvements are rain garden observation deck, irrigation system, planting, and mulch p. 6-21) Bayside Manor Park Table: irrigation/drainage and plants/vegetation could be GI.
The City of Millbrae Parks and Facilities inventory discusses urban landscaping, recommendations for traffic calming, and **potential improvements such as rain gardens, all of which can** implement **GI.**	

7.4 Sustainability Commitments and Community Expectations

The GI Plan is consistent with existing sustainability goals set by the City in its soon-to-be-adopted Climate Action Plan (CAP) and soon-to-be-updated General Plan.

The CAP will be adopted in 2019 and will set a goal of reducing greenhouse gas emissions. Some strategies that can be used to reduce greenhouse gas emissions align well with GI implementation. For example, water conservation is both an energy use reduction measure and can promote water quality improvements by limiting the amount of excess water which runs off properties and collects pollutants. Reducing gas emissions from vehicles by promoting walking and biking as safe modes of travel can be achieved through the incorporation of GI measures such as stormwater curb extensions, which act as traffic calming measures and water quality improvement measures.

The City's General Plan was adopted in 1998, and since that time the City has grown and changed. The City is undertaking a General Plan update which will establish goals and policies looking ahead to the year 2040. The General Plan update will be put through a public and Planning Commission vetting process; until then, the content of the General Plan update is still dynamic and will not be discussed in detail here. However, sustainability is anticipated to play a large role in the City's vision for the future. GI can be used as a sustainability strategy because it can protect natural habitats and other biological resources, promote healthy streams and riparian corridors, enhance the urban forest, improve water quality, reduce pollutants in stormwater runoff, and prepare for the potential impacts of climate change. GI will allow the City to protect the quality of its streams and natural wetlands while creating a more attractive streetscape. By adhering to the guidelines laid out in this document, the City is actively working toward achieving these long-term sustainability goals.

7.5 Alignment with Countywide or Statewide Programs

Two programs initiated by Caltrans—the Systemic Safety Analysis Report Program (SSARP) and the Active Transportation Program (ATP)—are good candidates for coordination with GI improvements.

The goal of the SSARP is to help local agencies identify safety projects to submit for Highway Safety Improvement Program (HSIP) funding consideration. Through the funding of SSARPs, local agencies are encouraged to evaluate their roadway networks with an approach that has been effective for addressing safety issues. This program will act as a tool for the City to identify, prioritize, and map potential and planned projects which can implement GI.

The purpose of the ATP is to encourage increased use of active modes of transportation, such as biking and walking. This program consolidates several existing federal and state transportation programs—Transportation Alternatives Program (TAP), Bicycle Transportation Account (BTA), and State Safe Routes to School (SR2S)—into a single program with a focus on making California a national leader in active transportation. Similar to the SSARP, the ATP can act as a tool for the City to identify, prioritize, and map potential and planned projects in which GI can be implemented.

7.6 Maintenance and Engineering Standards

With the approval of this GI Plan, the City adopts the GreenSuite, which is the combination of the *GI Design Guide* and the *C.3 Regulated Projects Guide,* and any amendments thereof, as its GI guidelines. **Refer to Section 6.2.2 of the GI Plan.**

7.7 Future Updates

The City is in the process of revising its General Plan, incorporating GI in each element wherever possible. The updated General Plan will include specific language about GI in sections including, but not limited to, Land Use, Circulation, Housing, Conservation, Noise, Open Space, Safety, and Environmental Justice.

In addition to the General Plan, the City is in the process of developing a Downtown Specific Plan, Climate Action Plan, and Active Transportation Plan. The documents involve the development and redevelopment of public infrastructure and provide opportunities to implement GI. Staff from the Planning Department and Public Works Department are involved in the review process of all documents to ensure consistency and alignment with the goals and policies of each other as well as the GI Plan.

Planning and Public Works staff will be involved in the development and implementation of planning documents, ensuring that the requirements and policies of the GI Plan are incorporated. The City anticipates that the 2020 General Plan Draft, CAP, and ATP will be published in the winter of 2019 and the El Camino Real Downtown Specific Plan Draft will likely follow shortly thereafter in 2020. The anticipated update schedule is presented in Table 12.

Table 12. *Schedule for update of planning documents.*

Name of Plan to be Completed / Updated	Anticipated Date of Completion / Update
Millbrae General Plan Draft	Winter 2019
Millbrae Climate Action Plan	Winter 2019
Millbrae Active Transportation Plan	Winter 2019
Millbrae El Camino Real Downtown Specific Plan	December 2020

8.0 FUNDING OPTIONS

8.1 Introduction

Provision C.3.j.i.(2)(k) of the MRP states that the Green Infrastructure (GI) Plan shall contain the following:

> *"An evaluation of prioritized project funding options, including, but not limited to: Alternative compliance funds; grant monies, including transportation project grants from federal, State, and local agencies; existing Permittee resources; new tax or other levies; and other sources of funds."*

To undertake an evaluation of potential funding options and sources, the City of Millbrae conducted the following:

- Reviewed the GI program elements and associated costs;
- Participated in the development of a Nexus Funding Evaluation, which identified and evaluated the feasibility of various funding strategies through the GI TAC;
- Assessed the funding strategies of the Nexus Funding Evaluation for local applicability;
- Discussed opportunities for public and private cooperation; and
- Developed a process for funding GI through integration into the City's existing CIP.

A single source of revenue for GI is unlikely to cover all the various elements of a GI program. Instead, implementation of GI will require a range of funding sources. This chapter is a starting point to both gauge funding needs and develop a suite of funding options for use with GI. As the program develops, the funding needs and opportunities may change. This chapter and the City's approach to funding may be revisited in the future as more information becomes available and more awareness is brought to the GI policies and requirements.

8.2 GI Program Elements and Funding Needs

8.2.1 Current Assessment of GI Costs

Implementation of GI measures is expensive. It is estimated that the cost to install the GI required to be in place by 2040 per the MRP ranges in the tens of millions of dollars for the capital (construction) costs alone. Additional costs include management of the GI program, planning, design, tracking of completed projects, as well as operations and maintenance.

One of the difficulties of developing funding for GI is that few funding sources are available which can be used for all the elements of a GI program throughout its lifecycle. For example, grants can be used to fund design and construction costs, but not overall management of the GI program or operations and maintenance costs.

GI costs may include the following:

- **Program Management.** Though the City has managed MRP compliance for many years, GI implementation will take additional staff time beyond permit compliance activities which occurred prior to 2016. In addition to reviewing CIP projects for GI potential, City staff will track GI projects and monitor progress toward achieving the milestones for GI implementation for 2030 and 2040. Participation in the SMCWPPP GI TAC will also likely continue to be necessary past the date when the GI Plan is submitted in September 2019 to assist in developing the Countywide Sustainable Streets Master Plan and to coordinate with other San Mateo County agencies on GI implementation and tracking efforts. Interdepartmental meetings among the Public Works, Planning, and Parks and Recreation Departments will also likely continue to be necessary to ensure that GI is implemented successfully on private and public projects.

- **Capital Costs.** GI capital costs depend on the type of measure(s) to be implemented, the size of the facility, the ease with which such measure(s) can be incorporated on a project that includes other elements, and the local context (such as the ease of connecting to existing drainage systems, how steep the area is sloped, space limitations, and nearby existing utilities).

  Because of the limited construction cost data available for public GI projects in San Mateo County, it is difficult to estimate their cost. Several private projects have been constructed in San Mateo County, but often the City does not have access to the detailed cost data for the GI component(s). Private project and public project costs differ in key ways: public projects must contend with the removal and modification of existing street infrastructure, utility conflicts, space limitations, pedestrian safety and grade limitations, and must be constructed with prevailing wage labor forces. San Mateo County also tends to have higher construction costs than other Bay Area counties, and California in general has higher construction costs than the nationwide average. In addition, GI detailing can vary widely from jurisdiction to jurisdiction, making it difficult to make cost comparisons among projects.

  Current (2019) capital costs for a bioretention area can range from $50 to $150 per square foot, a span highly dependent on local context, grading required, water and power sources, storm drain connection proximity, and selected plant palette and irrigation system. Permeable paving can range from $25 to $100 per square foot, depending on the depth of the section and whether it is necessary to work around existing utilities or trees. Capital costs of $129,000 to $187,000 per acre of impervious area managed26 were quoted for projects in Onondaga County, New York, which would work out to roughly $258,000 to $374,000 for construction costs of curb extensions installed at an intersection which treats 2 acres of impervious surface area. Limited recent bid result data in San Mateo County suggest that a similar size project here would cost in excess of $500,000 to construct.

[26] The Real Costs of GI, Stormwater Report. (2015, December 2). https://stormwater.wef.org/2015/12/real-cost-green-infrastructure/.

- **Planning and Design Costs.** Planning and design costs for CIP projects are typically around 10-20% of the capital costs. Integrating GI into other capital programs can reduce both the construction costs for GI as well as the design costs. The SMCWPPP Green Infrastructure Design Guide *(Design Guide)* clarifies the application of GI on public projects. As GI becomes more common on public projects and GI designs are standardized, GI projects will become less expensive to plan and design.

- **Operation and Maintenance (O&M) Costs.** Limited data are available on maintenance costs, because maintenance is often performed by City staff as part of their regular course of business, making it difficult to separate time spent on maintenance of standard City landscaping and streets versus GI. It is possible that due to the specialized nature of the maintenance of GI measures, or if staff are otherwise at capacity on maintenance of other City infrastructure, the City may need to contract maintenance work to an outside vendor. Vendors may in the future have special GI maintenance certifications not held by staff, such as the Bay Friendly Landscaping certification or the National Green Infrastructure certification by the Water Environment Federation. In Onondaga County, New York, maintenance costs for bioretention areas were approximately $2,000 per acre of impervious area managed per year. This would be $4,000 per year for curb extensions installed at an intersection which treats 2 acres, or $200,000 in total over a 50-year life of the system. Again, these costs are likely lower than what would be anticipated in San Mateo County, and do not reflect inflation or the rising cost of construction projects. The Design Guide further clarifies GI maintenance needs, leading to standardized maintenance practices and lower maintenance costs.

- **Outreach and Education Costs.** The City will continue to participate in outreach and education for stormwater quality through the SMCWPPP Public Information and Participation (PIP) subcommittee. However, due to its limited budget and various priorities (e.g., trash and litter reduction as well as outreach to businesses and construction sites to coordinate with the stormwater inspection programs), the PIP subcommittee may have limited ability to offer GI-related outreach. However, ongoing outreach and education is an important facet of GI implementation, because it can lead to not only a better understanding of the measures being installed, but also could build support for a dedicated GI or environmental protection funding source. This may result in the construction of GI elements within individual homes and businesses on a voluntary basis.

- **Inspection Program Costs.** The City inspects private GI projects in accordance with its Enforcement Response Plan and Provision C.3.h of the MRP. The City's O&M agreement template allows for the City to seek reimbursement of the inspection costs. A typical inspection, including time for coordinating with the site representative and writing an inspection report, takes approximately three (3) hours per site. If follow-up inspections are required, an additional three (3) hours is often required for each follow-up visit. The frequency of inspections is specified in the

City's ERP, but generally sites are inspected on a 5-year interval or more frequently, and 20% of the City's GI projects are inspected each year. At least one site is inspected per year, at a total cost of approximately $500-$1,000 per year. As additional GI projects are constructed, this cost will increase.

Figure 22 depicts the estimated relative costs of the GI program elements for a GI project with an assumed $500,000 construction cost consisting of stormwater curb extensions at an intersection. Limited data are available to ascertain these relative costs, so they have been assumed until more data becomes available.

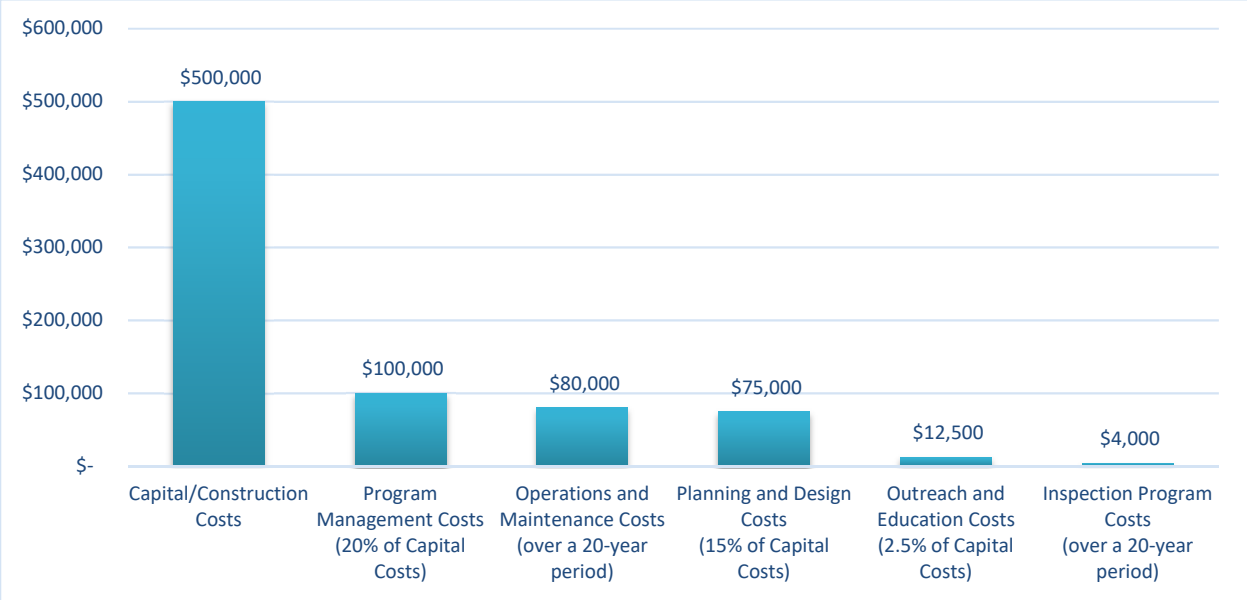


Figure 22. *Estimated Relative Costs of GI Program Elements.*

8.2.2 Future Assessment of GI Costs

Section 8.2.1 describes the costs associated with the various elements of a GI program based on limited funding information available in San Mateo County and in other areas of the United States. Estimated costs for GI will be improved over time with agency-specific and County-specific knowledge as the GI program is implemented. Future sources of cost estimating data will include bid results from GI projects; proposals received from designers and construction management firms to design and inspect GI projects; actual consultant and staff time spent providing program management, planning, and outreach services; public works maintenance staff time performing maintenance on GI systems; and time spent performing inspections. It will likely be difficult to assess time spent by staff on tasks relating to GI, as it will not necessarily be tracked separately from other staff time.

The City may also draw from other published resources available to estimate the costs of GI. For example, the SFPUC has made its cost estimating model available to other municipalities to use for planning-level analyses. This Excel-based model can be used as a planning tool to plan and budget for GI maintenance obligations for labor and costs. The user will be able to input user-defined project attributes (e.g., BMP type, size, date), and the model will yield long-term maintenance costs and staffing obligations as outputs.

8.3 Funding Strategies

Through the GI TAC, the City and SMCWPPP developed a GI Funding Nexus Evaluation document for jurisdictions within San Mateo County with the goal of expanding on existing stormwater funding sources and supplementing them with strategies in line with GI implementation goals. The Nexus Funding Evaluation describes and evaluates funding mechanisms, outlines funding needs, and provides strategies to procure such funding for design and construction of new GI. This subsection is intended to describe the City-specific approach to the funding strategies discussed in the Nexus Evaluation. Rather than repeating the information available in the Nexus Evaluation, this subsection can be used in connection with the Nexus Evaluation to further explore those funding options that align with the City's priorities. It is anticipated that the evaluation of funding options for GI is an ongoing process and will be revisited as the program develops.

BALLOTED APPROACHES

The most sustainable and formative funding approach, but also the most challenging. Successful balloted approaches are most inclined to provide significant funding for stormwater management and stormwater-related projects. The two biggest challenges for balloted approaches are planning the strategy for the proposed project/program and effectively presenting the project and vision to the voting community. Examples of balloted approaches include the following:

- **Parcel Taxes**
- **Other Special Taxes**
- **Property-Related Fees**
- **General Obligation Bonds**

City-Specific Approach: At this time, the City does not plan to pursue GI-specific parcel taxes, other special taxes, property-related fees, or general obligation bonds, but may revisit these funding approaches as the program develops. Other local agencies may implement these funding strategies in the coming years. By delaying implementation of these funding strategies, the City can build upon the efforts of these early adopters.

NON-BALLOTED APPROACHES

These include funding strategies that do not require a ballot or voter approval. Non-balloted approaches may encounter lack of support from the general public; therefore, a nexus study/cost analysis is required to determine the middle-ground cost that would not be considered a tax to the payer of the fees. Examples of non-balloted approaches include the following:

- **Senate Bill 231**
- **Regulatory fees**
- **Developer Impact Fees**
- **Re-Alignment**
- **Grants**
- **Loans**

City-Specific Approach: The City has already successfully pursued grants for GI (such as the C/CAG SRTS/GI grant in 2018) and will continue to pursue grant opportunities as they arise. The City could receive future funding via transit-related projects through MTC's Plan Bay Area 2050. At the Countywide level, the City will help to lobby for the inclusion of GI funding in transportation grants, stormwater grants, and other grants for capital programs that lend to integration with GI.

The City adopted various developer impact fees in association with the Millbrae Station Area Specific Plan (e.g., sewer connection, facility impact). The City has good credit and could explore pursuing loans. The City will also consider realigning some stormwater services, such as sewer, water, and refuse collection (many public agencies in California have consolidated these or similar services into one "stormwater department").

Senate Bill 231, signed by Governor Brown on October 6, 2017, helps to clarify that "sewer" is intended to be used interchangeably to mean "storm sewer" and "sanitary sewer" to gain access to funds made available by Proposition 218. However, there is no legal precedent for an agency's instituting stormwater fees without a ballot measure, and it is important for any agency considering such an approach to consult with other agencies and industry groups to coordinate their efforts in a strategic manner. The City will continue to support Senate Bill 231 at a Countywide level through SMCWPPP and C/CAG.

The City currently does not have regulatory or developer impact fees, but may revisit these funding approaches later as the program develops. The City will also explore opportunities for realignment of funds.

SPECIAL FINANCING DISTRICTS

Financial frameworks that were constructed by the local government to levy fees, taxes, and assessments for any improvements and services conducted. Most special financing districts are required to conduct a ballot that includes affected property owners, but in most cases, these affect small areas or an individual landowner. Examples of special financing districts include the following:

- **Benefit Assessments**
- **Community Facilities District**
- **Business Improvement Districts**
- **Enhanced Infrastructure Financing Districts (EIFD)**

City-Specific Approach: In February 2019, the City began internal discussions regarding the possibility of implementing special financing districts. An internal meeting between CDD and the City Manager was held. This would allow the City to break up Millbrae into districts, each reflecting unique land uses and characteristics and different improvement goals. For example:

1. Downtown
2. El Camino
3. Bayside Manor
4. Hillside (e.g., Millbrae Estates)
5. Near the Taylor Middle School Project

If the City does implement special financing districts, GI improvements could be considered. In addition to new GI treatment measures being funded, planter strips could be replanted, or tree maintenance could be funded.

PARTNERSHIPS

Partnerships are effective strategies to acquire additional funds and resources needed for GI improvement projects. Collaborative efforts do not guarantee direct additional funding, but they can establish alternative benefits that will supplement the overall resources necessary to complete proposed GI projects. By distributing resources and funding throughout different entities, GI improvement projects and programs are capable of being delivered more cost-effectively. Examples of partnerships include the following:

- **Multi-Agency Partnerships (includes Regional Projects)**
- **Transportation Opportunities**
- **Caltrans Mitigation Collaboration**
- **Public-Private Partnerships (P3)**
- **Financial Capability Assessment**
- **Volunteers**

City-Specific Approach: The City will explore opportunities to collaborate on different types of projects and create incentives for the installation of GI. For example, the City will explore collaborations with the following entities:

1. *School District:* A bioretention can be installed and some City rights-of-way can be treated.
2. *Golf Course:* A bioretention can be installed or the existing basin can be enlarged to be used for irrigation and rainwater harvesting.
3. *Caltrans:* El Camino Real and Grand Boulevard can be converted to green streets.
4. *Airport:* Sea level rise projects can be implemented. GI features could act as additional storage, or a "living shoreline" could be used.

Transportation funds can also be allocated to GI projects. Here are a few examples:

1. Active Transportation Plan
2. Grand Boulevard Initiative
3. BART
4. Transit-Oriented Development Projects #1 and #2
5. High-speed rail: Millbrae will be designated as a multimodal station. When developing that station, GI can be incorporated.

Volunteer projects can also implement GI. One possibility could be organizing a small planting event.

ALTERNATIVE COMPLIANCE

Previously, the SFRWQCB has provided alternative compliance options in Provision C.3.e.i of MRP 2.0 which can be utilized on Special Projects that meet certain criteria and cannot feasibly install the required amount of LID treatment onsite. The alternative options include the following:

- **Construction of a joint stormwater treatment facility with the ability to treat combined runoff from two or more C.3 Regulated Projects**
- **Construction of a stormwater treatment system off-site**
- **Payment of an in-lieu fee for regional projects**

These and other alternative compliance options can also be used on Non-C.3 Regulated Projects, but with more flexibility than what could be used on C.3 Regulated Projects. On C.3 Regulated Projects, the alternative compliance site must be within the same watershed as the site to be mitigated and must be constructed within three (3) years of the site to be mitigated. Regional project timelines may be extended up to five (5) years. These same restrictions do not apply to Non-C.3 Regulated projects.

Examples of alternative compliance include the following:

- **In-Lieu Fees**
- **Credit Trading**

City-Specific Approach: Under the terms of the current MRP, in-lieu fees cannot be implemented simply enough to ensure successful funding of GI projects. If the regulations change to offer more flexibility, the City may reassess opportunities for in-lieu fees on C.3 Regulated Projects. As more GI projects are identified through the CIP screening process **(see Chapter 4, Project Identification and Prioritization),** there will be more opportunities to utilize alternative compliance.

The City is interested in a future credit trading program and will continue to work with SMCWPPP to explore this option further. A countywide approach to green infrastructure implementation is expected to have greater cost savings than the citywide approach because it aims to install GI in areas with more pollutants (e.g., old industrial areas). A countywide approach is not only more cost effective but also provides a vehicle for collecting funding for regional projects, the costs of which can be shared by multiple jurisdictions since they will benefit from the cumulative load reductions. This provides an opportunity for credit trading between agencies. It is important to note that although a countywide approach would result in significant cost savings, there are notable challenges with pursuing this route. These challenges include the following:

- **Fair and equitable cost-sharing.** For cities that do not have a heavy concentration of pollutants, it may be difficult to quantify how much they should contribute to fund the regional project, especially if the project is not located within their jurisdiction.

- **Ongoing maintenance for the project.** Agencies that have a regional project within their jurisdiction are expected to maintain that project in perpetuity. This effort can be difficult to split among several municipalities in terms of costs of maintenance, including staff time.

As the GI program develops, further discussions about collaborations will occur. The RAA has allowed for the possibility of credit trading by providing multiple management metrics for green infrastructure, such as impervious area to be treated in acreage and green infrastructure capacity in acre-feet.

8.4 Economic Vitality Benefits and Public-Private Cooperation

Establishing additional requirements for the installation of GI on private property may create an undue burden on private property owners and developers. At the same time, the costs to comply with the GI milestones are significant, and it is necessary to share some of these costs with the private sector.

By communicating the benefits of GI to local businesses, the City hopes to encourage voluntary implementation of GI and/or build support for a special financing district to avoid needing to resort to additional blanket-style requirements on developers. On a project-by-project basis, the City can assess opportunities to meet water quality goals and scale implementation to fit the project constraints. The City will continue to explore public and private cooperation opportunities as the GI program develops.

GI can help to support economic vitality by providing access to landscape and green spaces, which results in the following direct benefits to residential and commercial areas[27]:

- Higher property values and rent value
- Increased consumer spending in commercial districts
- Energy savings
- Reduced lifecycle and maintenance costs (for some treatment measures)
- Lower possibility of flood damage
- Lower water bills, if rainwater harvesting is used
- Reduced crime
- Improved health and job satisfaction for office employees
- Healthier and more sustainable communities
- Community placemaking
- Improved worker productivity
- Increased potential that patrons will linger longer on retail main streets
- Higher occupancy rates for apartments and shorter periods between leases

8.5 Integration of GI with the Capital Improvement Program

[27] *GI Design Guide,* 1st Edition. (2019, June). San Mateo County Water Pollution Prevention Program. Page 1-13.

One obstacle to funding a GI program is that the City must balance the many needs of its community to both keep the City operational and well-maintained while working towards the goals and vision set forth in the City's General Plan. Pavement maintenance, replacement and repair of underground utilities, transportation improvements, performing facility needs assessments and making facility upgrades, and parks improvements are all key facets of the City's CIP. The City can adopt innovative approaches to working within the framework of the existing CIP and budget in order to fund GI.

Though it is primarily an outgrowth of a stormwater or environmental program, GI can be considered an expansion of many different CIP projects because it provides benefits beyond simply improving water quality (see Figure 23).

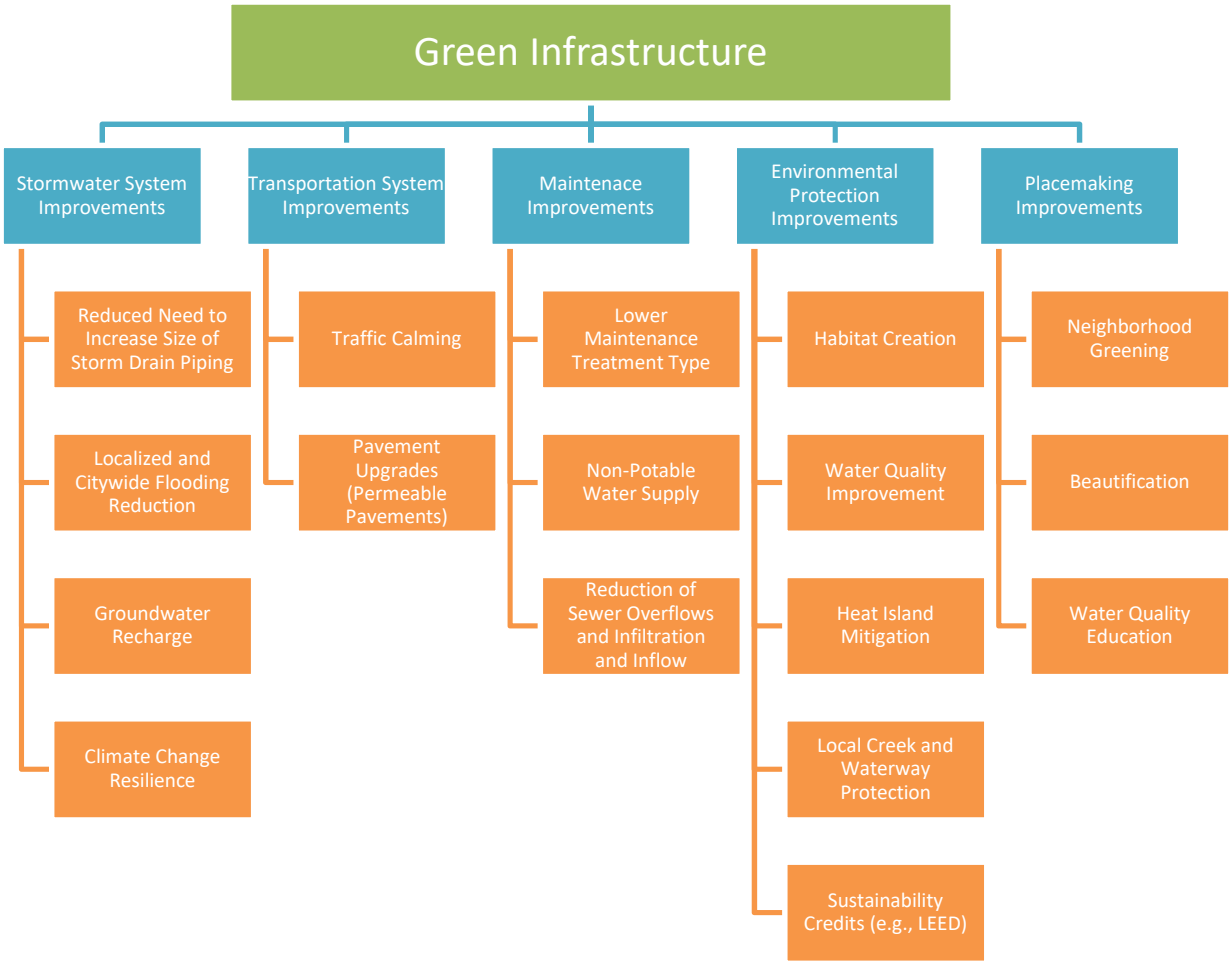


Figure 23. *Integration of GI with other types of improvements.*

By recognizing the many direct and ancillary benefits of GI, it becomes possible to integrate GI on several CIP projects if the project goals align with the GI benefits. Examples of projects that potentially lend to integration with GI include the following:

- Park or facility upgrades
- Pavement rehabilitation

- Creek channel repairs
- Storm drain repairs
- Complete streets projects

Some cost reduction is achieved by early incorporation of GI. By integrating GI into the project scope early, the project can incorporate GI more seamlessly, and in a way that does not greatly increase project costs. Prioritization and early screening of CIP projects is discussed in Chapter 4, Project Identification and Prioritization.

8.6 Green Infrastructure Grant Funding Programs

The section highlights various sponsoring agencies which periodically release grant opportunities for green infrastructure projects, in Tables 13, 14, and 15. The City of Millbrae acknowledges City of Burlingame staff for their assistance with the development of this section of the GI Plan.

In addition, EPA has developed a Water Finance Clearinghouse[28] that provides communities with a searchable online database of more than $10 billion in water funding sources and over 550 resources to support local water infrastructure projects.

Table 13. *Federal GI Grant Programs*

FEDERAL GRANT PROGRAMS	
Sponsoring Agency and Grant Name	**Description and Website**
U.S. Federal Emergency Management Agency Hazard Mitigation Grant Program	The purpose of the HMGP program is to help communities implement hazard mitigation measures following a Presidential major disaster declaration. Hazard mitigation is any action taken to reduce or eliminate long term risk to people and property from natural hazards. Mitigation planning is a key process used to breaking the cycle of disaster damage, reconstruction, and repeated damage. http://www.fema.gov/hazard-mitigation-grant-program-guide-state/local-governments
U.S. Environmental Protection Agency Nonpoint Source Implementation Grants (319 Program)	Under Section 319, states, territories, and tribes receive grant money that supports a wide variety of activities including technical assistance, financial assistance, education, training, technology transfer, demonstration projects, and monitoring to assess the success of specific nonpoint source implementation projects. http://www.epa.gov/nps/319-grant-program-states-and-territories
U.S. Federal Emergency Management Agency	The PDM Program is designed to assist States, U.S. Territories, Federally-recognized tribes, and local communities in implementing a sustained pre-

[28] The EPA Water Finance Clearinghouse website can be accessed at https://www.epa.gov/waterfinancecenter/water-finance-clearinghouse.

Pre-Disaster Mitigation Program	disaster natural hazard mitigation program. The goal is to reduce overall risk to the population and infrastructure from future hazard events, while also reducing reliance on Federal funding in future disasters. http://www.fema.gov/pre-disaster-mitigation-grant-program

Table 14. *State GI Grant Programs*

CALIFORNIA GRANT PROGRAMS	
Sponsoring Agency and Grant Name	**Description and Website**
California Natural Resources Agency Environmental Enhancement and Mitigation Grant	The Environmental Enhancement and Mitigation Program provides funding for projects that are one of the following: urban forest projects designed to offset vehicular carbon dioxide emissions, projects for the acquisition or enhancement of lands, or projects that mitigate the impact of Transportation Facilities. http://resources.ca.gov/grants/environmental-enhancement-and-mitigation-eem
California Natural Resources Agency Trails and Greenways Grant	The Trails and Greenways grant program, funded by Proposition 68, funds projects that provide non-motorized infrastructure development and enhancements that promote access to parks, waterways, outdoor recreational pursuits, and other natural environments to encourage health-related active transportation and opportunities for Californians to reconnect with nature. http://resources.ca.gov/grants/trailsandgreenways
California Natural Resources Agency Urban Greening Grant	The Urban Greening Program funds projects with a specific focus on achieving greenhouse gas reductions by sequestering carbon, decreasing energy consumption, and reducing vehicle miles traveled. http://resources.ca.gov/grants/urban-greening
Coastal Conservancy Climate Ready Grant	The Climate Ready Program provides funding for multi-benefit projects that use natural systems to assist communities in adapting to climate change. http://scc.ca.gov/climate-change/climate-ready-program
Coastal Conservancy Proposition 68 Grants	Proposition 68 provides funding for projects that create parks, enhance river parkways, or protect coastal forests and wetlands. Proposition 68 also funds outdoor access, lower cost coastal accommodations, and climate adaptation projects. http://scc.ca.gov/grants/proposition-68-grants
Metropolitan Transportation Commission	OBAG funds can be used for streetscape enhancements, bicycle and pedestrian improvements and safe routes to school projects.

One Bay Area Grants	https://mtc.ca.gov/our-work/fund-invest/investment-strategies-commitments/focused-growth/one-bay-area-grants
State Water Resources Control Board Storm Water Grant Program	The purpose of the Storm Water Grant Program is to fund storm water and dry weather runoff projects that best advance the Water Board's policy goals of improving water quality and realizing multiple benefits from the use of storm water and dry weather runoff as a resource. http://www.waterboards.ca.gov/water_issues/programs/grants_loans/swgp

Table 15. *Countywide GI Grant Programs*

POTENTIAL COUNTYWIDE GRANT PROGRAMS	
Sponsoring Agency and Grant Name	**Description and Website**
Flood and Sea Level Rise Resiliency Agency District	The County of San Mateo is in the process of forming a Flood and Sea Level Rise Resiliency Agency District which could help to fund GI projects, especially regional projects which will benefit multiple jurisdictions. https://publicworks.smcgov.org/projects/flood-and-sea-level-rise-resiliency-agency
City/County Association of Governments (C/CAG)	C/CAG periodically issues calls for projects which are eligible for C/CAG funding. In 2017, C/CAG sponsored a grant for combination Safe Routes to School and Green Streets projects, which integrated stormwater quality and traffic calming improvements. http://ccag.ca.gov/opportunities/

8.7 Integration of GI with Adopted Budget

The section following describes further both local funding sources. Table 16 is an introduction to the City's basic funding sources which are represent in the annual adopted budget. As the Capital Improvements Program (CIP) projects are screened for Green Infrastructure Potential, funding for their green infrastructure elements will often be secured from one of these fund types.

Table 16. *Local Sources for GI Project Funding.*

CAPITAL IMPROVEMENTS PROGRAM FUNDING	
Fund Type	**Description and Website**
General Fund	The General Fund is the City's chief operating fund. Revenues which contribute to the City's General Fund may include property tax; sales and use tax; transient occupancy tax; franchise tax; business tax; State Homeowners Property Tax Relief

	(HOPTR); real property transfer tax; licenses and permits; fines, forfeitures, and penalties; charges for services; and interest income. The City of Millbrae's "adopted budget" is hosted on the City website, and is updated every fiscal year, in July.
Special Revenue Funds	Special Revenue Funds represent funds with a dedicated revenue source set aside for a specific purpose. Examples: Measure A, Measure M, Measure I, Gas Tax, Storm Drain Fees, SB-1, and Grants
Enterprise Funds	Enterprise Funds consist of revenue the City receives as a result of services and activities for which a fee or rate is charged to customers. These funds are self-sustaining. Examples: Building or engineering plan review, Parking, Landfill, Sewer, Solid Waste, and Water.

The City of Millbrae has the following funding sources in its 2018-2019 Adopted Budget:

- General Fund
- Measure A Funds
- Sanitation Fund*
- Stormwater Fund
- Vehicle Replacement Fund*
- Community Center Rebuild Fund
- Gas Tax
- Contributions from Developers
- Sewer Modernization Fund*
- Water Fund*
- Public Education and Government Access Fund

*Likely not sources of funds that could be utilized for GI.

In order to facilitate the future integration of GI in the CIP, a sample list of potential GI measures which may be integrated into various types of projects is shown in Table 17.

Table 17. *Sample Integration of Potential GI Measures with Adopted Budget.*

TYPES OF PROJECTS	FUNDING SOURCES	POTENTIAL GI MEASURES										OTHER TREATMENT MEASURES
		Stormwater Planter / Rain Garden	Stormwater Curb Extension	Tree Well / Stormwater Tree / Interceptor Tree	Infiltration System	Pervious Pavement	Green Roof	Rainwater Harvesting	Vegetated Swale	Green Gutter	Green Wall	Hydrodynamic Separator Media Filter High-Flow Rate Tree Well Filter
Other Agency Projects • BART TOD Projects • Other Future Potential Projects	Private Funding	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Private – Public Partnership Projects • Future Potential Projects	Private Funding General Fund Gas Tax Measure A Grants	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Pavement Rehabilitation • Annual Street Reconstruction / Resurfacing • Other Future Potential Projects	General Fund Gas Tax Measure A Grants	✓	✓	✓	✓	✓			✓	✓		
Transportation • ADA Transition Plan • TDA Active Transportation • Millbrae Avenue Bike Bridge • Sidewalk Program • Other Future Potential Projects	General Fund Gas Tax Measure A Grants	✓	✓	✓	✓	✓			✓	✓		
Stormwater • Millbrae Avenue Storm Culvert Design • Storm Drain Master Plan Implementation • Other Future Potential Projects	General Fund Storm Drain Fund Grants	✓	✓	✓	✓							✓
Park Improvements • Landscape Improvements • Parks Improvements • Other Future Potential Projects	General Fund	✓		✓	✓	✓		✓	✓			
Non-Stormwater / Facilities • Facilities Master Plan • Community Center Rebuild • Other Future Potential Projects	General Fund Community Center Rebuild Fund	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

9.0 OUTREACH AND EDUCATION

9.1 Introduction

The MRP states that each Permittee under a Green Infrastructure (GI) Plan shall perform the following tasks:

> *Provision C.3.j.i.(4)(a): "Conduct public outreach on the requirements of this provision, including outreach coordinated with adoption or revision of standard specifications and planning documents, and with the initiation and planning of infrastructure projects. Such outreach shall include general outreach and targeted outreach to and training for professions involved in infrastructure planning and design."*
>
> *Provision C.3.j.i.(4)(b): "Train appropriate staff, including planning, engineering, public works maintenance, finance, fire/life safety, and management staff on the requirements of this provision and method of implementation."*
>
> *Provision C.3.j.i.(4)(c): "Educate appropriate Permittee elected officials (e.g., mayors, city council members, county supervisors, district board members) on the requirements of this provision and methods of implementation."*

The three primary goals of the outreach and education effort are summarized in Table 18:

***Table 18**. Outreach and Education Goals, Objectives, and Audiences.*

Outreach and Education Goal	Objective	Audience
Public Outreach	Conduct public outreach on the GI requirements, including outreach coordinated with adoption or revision of GI guidelines and standards as well as planning documents, and with the initiation and planning of infrastructure projects.	Both the general public and professionals involved in GI planning and design.
Train Appropriate Staff	Conduct training on the GI requirements and the methods of implementation.	Planning, Engineering, Public Works Maintenance, Finance, Fire/Life Safety, and Management Staff.
Education of Elected Officials	Conduct outreach on the GI requirements and methods of implementation.	City Council

One of the first steps in the development of a GI Plan is educating department staff, managers, and elected officials about the purposes and goals of GI, the benefits of GI, the required elements of the GI Plan, and the steps needed to develop and implement the GI Plan. It is vital to earn the support of City Council, City staff, and members of the public to ensure successful implementation of the GI Plan. Outreach and education efforts began in FY 15-16 and will continue even after GI Plan adoption.

9.2 Public Outreach

9.2.1 Local Efforts

The City conducted outreach in coordination with approval of the GI Workplan and GI Plan. **Refer to Section 9.4, Education of Elected Officials.**

In addition, the City developed a GI Map using ArcGIS Online to feature the existing and potential GI projects within the City. **Refer to Section 5.3, City Public-Facing Project Tracking System.** This map was made accessible to the general public in July 2019.

The City plans to install educational signage on a case by case basis in coordination with public installations of green infrastructure (see Figure 24 below for an example).

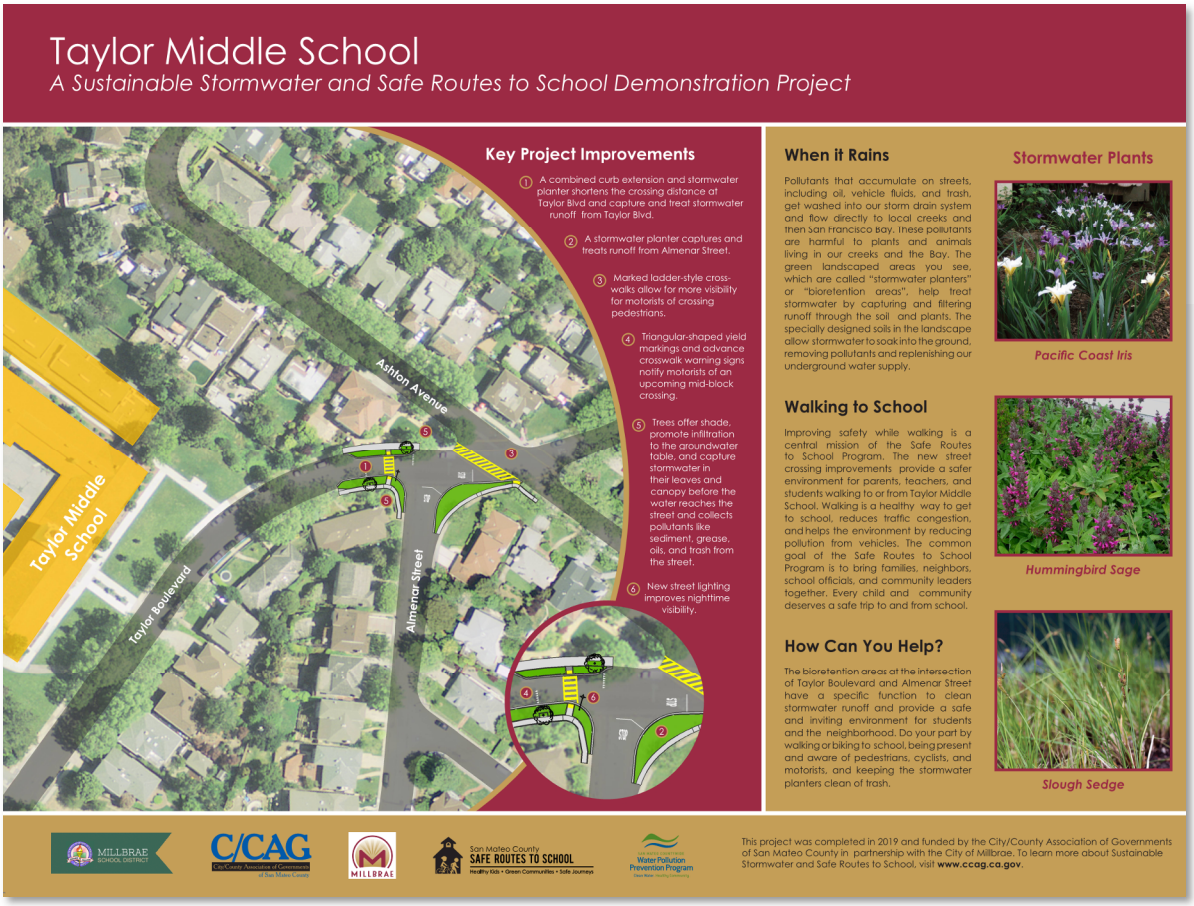


Figure 24. *GI Educational Signage installed in coordination with the Taylor Middle School Safe Routes to School / Green Infrastructure Demonstration Project.*

9.2.2 SMCWPPP Efforts

SMCWPPP has several committees which discuss ideas, plans, and schedules for new and ongoing participation in processes to promote GI, such as the New Development (ND) Committee, GI Technical Advisory Committee (GI TAC), and the Public Information and Participation (PIP) Committee.

SMCWPPP's PIP Committee releases an internal bimonthly document detailing its recent and future outreach efforts. This outreach work includes distribution of information about rain barrel rebates, provision of public-facing GI presentations and outreach materials, and dissemination of information about public outreach and citizen involvement events, as well as the Flows to Bay website which explains GI basics and provides links to documents relevant to municipal staff and elected officials, such as the *C.3 Regulated Projects Guide* and *Design Guide* (see Figure 25).

Figure 25. *SMCWPPP "Flows to Bay" Webpage, featuring the Green Infrastructure Design Guide.*[29]

On June 18, 2019, SMCWPPP hosted a training event for municipality staff and design professionals to cover the new and updated guidance documents produced, including the *Design Guide* and *C.3 Regulated Projects Guide*.

SMCWPPP also engaged the public during the development of the Stormwater Resources Plan (SRP), which established a prioritization protocol for GI projects and an initial list of prioritized projects. Key public engagement efforts included the following (SMCWPPP 2017):

- Four (4) presentations to the SMCWPPP Stormwater Committee (public meetings) between January and November 2016.

[29] *San Mateo County Green Infrastructure Design Guide.* (2019b). SMCWPPP. https://www.flowstobay.org/gidesignguide.

- C/CAG staff presented on the SRP planning process at the Sustainable San Mateo County's November 2015 Water Indicator Summit and San Mateo County's Office of Sustainability's Sea Level Rise in July 2016.
- When the draft SRP was complete, C/CAG hosted three (3) public workshops to solicit public and stakeholder feedback in January 2017. At these workshops, C/CAG described the upcoming GI plans and how the SRP relates to that effort.
- C/CAG staff and consultants promoted the SRP workshops through social media (Facebook and Twitter).
- A press release was distributed to local media outlets, including both print and online publications, to advertise the workshop. The press release also called attention to the Flows to Bay website (www.flowstobay.org), where the public could review the draft SRP and submit comments.

9.3 Train Appropriate Staff

Permittees must conduct training for appropriate staff on the requirements of the MRP and methods of GI implementation. The City began this process in FY 15-16 with the development of the GI Workplan and continued to engage staff to discuss GI implementation. Interdepartmental coordination and staff training efforts included the following:

- Convened interdepartmental meetings with affected department staff and management to discuss GI requirements and GI plan development. Key departments involved included Public Works and Planning. Outside of meetings, communication was maintained via email to update staff on the progress of the GI Plan and to receive feedback on a regular basis.
- Discussed the potential for incorporation of GI on CIP projects and continued to refine and add to the City's list of planned and potential GI projects. This list will continue to be updated in future years as part of the GI Plan implementation process.
- Participated in SMCWPPP training events.
- Participated in the SMCWPPP GI Subcommittee, New Development Subcommittee, and PIP Subcommittee. All these subcommittees discussed GI implementation and outreach.

9.4 Education of Elected Officials

On June 27, 2017, the City of Millbrae adopted a GI Workplan through City Council Resolution C-2017-36. The Workplan included educational material about GI and was reviewed by the Council ahead of the official submission. The "What is GI?" section focused on raising awareness of what GI looks like, why it's important, and how it can benefit the quality of life and health of residents. When elected officials have a better understanding of GI and its benefits, they are much more likely to support its development.

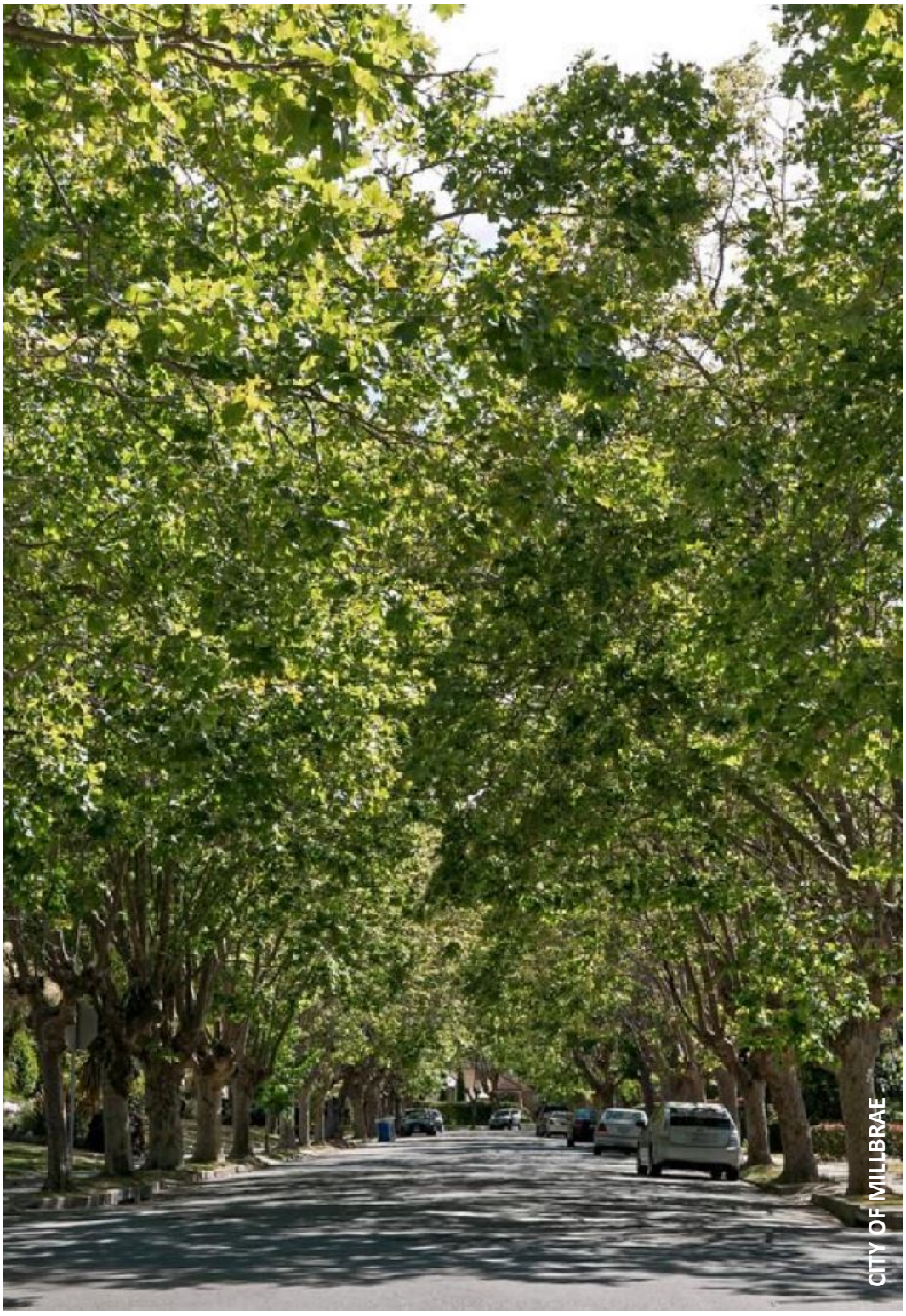
The City of Millbrae will conduct outreach to elected officials in coordination with GI Plan approval, with a study session to discuss the GI Plan on July 23rd, 2019 and GI plan approval to follow in September.

Changes made to local planning documents to support GI implementation are also reviewed and approved by the Planning Commission as well as City Council.

9.5 Next Steps

The City will continue to engage the public while implementing the GI plan to advertise the many benefits of GI and build support for GI projects. As part of the SMCWPPP FY 18-19 Annual Report, a plan and schedule for new and ongoing participation in processes to promote GI at the regional level will be developed. The following future approach and potential activities were discussed at a recent New Development Subcommittee:

- Continue actions related to the Regional Roundtable and reconvene the Roundtable with key participants such as San Francisco Bay Area Planning and Urban Research Association (SPUR), Caltrans, Save the Bay, and others. Bay Area Stormwater Management Agencies Association (BASMAA) and San Francisco Estuary Partnership (SFEP) will conduct tasks that address this idea, including creating an Executive Summary and Action Plan for the Roundtable "Roadmap" under a supplemental contract as part of the *Urban Greening Bay Area* grant.
- Continue to work with Caltrans on funding opportunities and GI implementation along State routes (e.g., El Camino Real).
- Continue to work with MTC to integrate GI into transportation plans and funding.
- Conduct workshops and trainings on asset management for GI, possibly in coordination with CASQA, the SFRWQCB, and/or the EPA.



Trees within cities play an important stormwater management role by providing stormwater runoff flow reduction, transpiration, and infiltration.

10.0 IMPLEMENTATION APPROACH

10.1 Overview

MRP Provision C.3.j.i.(3) requires each Permittee to complete the following:

> *"Adopt policies, ordinances, and/or other appropriate legal mechanisms to ensure implementation of the Green Infrastructure Plan in accordance with the requirements of this provision."*

The various elements of the Green Infrastructure (GI) Plan comprise an implementation toolbox (Figure 26 on the next page) that the City will access over the life of the GI Plan to foster improved water quality through design and construction of public and private GI facilities. As the GI program develops, the City will apply adaptive management strategies for flexibility in the face of changing conditions, development climates, and forecasts. Additional implementation strategies may be evaluated in the future.

The City of Millbrae is committed to implement GI into future projects when project opportunities arise, including on Bay Area Rapid Transit (BART) Transit-Oriented Development projects.

Figure 26. *City's starting Green Infrastructure Implementation Toolbox.*

10.2 Private Development Program and Policies

10.2.1 Standard Operating Procedures

The City is committed to shifting its conventional "gray" storm drain infrastructure to more resilient, sustainable stormwater management which reduces runoff volumes, disperses runoff to vegetated areas, harvests and uses runoff where feasible, promotes infiltration and evapotranspiration, and utilizes natural processes to detain and treat runoff. This will include implementing, to the extent practicable, Low Impact Development (LID) features and facilities such as pervious pavement, bioretention facilities ("rain gardens"), green roofs, and rainwater harvesting systems.

The City will continue to use its planning, zoning, and building authorities to require proposed new and redevelopment projects to incorporate LID features and facilities in accordance with the New Development and Redevelopment (Provision C.3) requirements and the current edition of the San Mateo County Water Pollution Prevention Program C.3 Guidelines.

The City's **development review process is summarized in flowcharts in Appendix C** for each of the following project phases:

- Entitlement Pre-Application Review
- Development and Redevelopment C.3 Applicability Review
- Entitlement Review
- Plan Review
- Construction Oversight
- Closeout / Acceptance / Occupancy

These flowcharts summarize the process by which both Provision C.3 Regulated and Non-C.3 Regulated Projects are reviewed (as well as the level of detail required) for each project phase. They demonstrate the coordination efforts required between City departments and external agencies. Documenting this process and integrating key information from the MRP helps to avoid information or department "siloing", where the requirements or process are only understood by a few key individuals. The City will aim to use these flowcharts to train new staff. City staff will periodically update the flowcharts as necessary to reflect new MRP requirements.

The City of Millbrae utilizes Standard Conditions of Approval (COAs) during the entitlement review phase to require implementation of GI in private developments. These COAs include requiring that applicants detain runoff onsite, incorporate Best Management Practices (BMPs), and minimize increases of impervious cover in accordance with the City's General Plan Policies. In addition, applicants must comply with the requirements of MRP Provision C.3, complete either the C.3 and C.6 Development Review Checklist or Stormwater Requirements Checklist for Small Projects, incorporate efficient landscaping systems, and, when feasible, incorporate landscaping that promotes surface infiltration, minimizes the

use of pesticides and fertilizers, and incorporates sustainable landscaping practices.[30] Applicants are additionally required to prepare and implement a Storm Water Pollution Prevention Plan (SWPPP) during construction to reduce or eliminate construction-related pollutants. Acknowledgement of, and agreement to abide by, NPDES BMPs must also be included with plans and enforced during construction.

The City can require implementation of GI on private development projects beyond traditional Provision C.3 requirements, such as requiring private developers to provide stormwater treatment within the public right-of-way for their frontage. During the development review process, the City will determine installation and maintenance responsibilities. Currently, the City is reviewing GI implementation requirements on a case-by-case basis but may revise the Standard COAs or environmental document review policies to require additional GI implementation.

10.2.2 Municipal Code

The City reviewed its existing ordinances and other legal policies to identify whether sufficient legal authority exists to implement the GI Plan and comply with the MRP.

Based on the existing Municipal Code, the City currently holds the legal authority to require implementation of GI in both public and private projects which are Provision C.3 Regulated under the MRP. The following sections of the City of Millbrae Municipal Code provide the City with the authority to require GI implementation (excerpted below; full versions of the Municipal Code can be accessed at https://www.codepublishing.com/CA/Millbrae/):

- Chapter 8.20 Municipal Sanity Sewer System.
    - 8.20.410 Discharges to the City's Storm Water Collection System. *The city's storm water collection system is for the purpose of collecting and transporting rain water only. Direct or indirect discharges of anything other than rain water to the city's storm water collection system are prohibited unless otherwise set forth in Chapter 8.70 MMC, Storm Water Management and Discharge Control*
- Chapter 8.45 Water Conservation.
    - 8.45.040 Landscaping. *[…] Consistent with the model ordinance, landscaping of any open space, park, playground, golf course, or other open area shall be planned to conserve water through choice of plants, landscape design and irrigation techniques. The development and use of the following water saving techniques shall be encouraged subject to relevant legal and economic constraints:*
        - *D. Collection and reuse of runoff water where possible*

[30] The City of Millbrae's Standard COAs are also outline the requirements for the removal of PCB-containing materials during demolition projects to prevent PCBs from entering storm drains. While these procedures are not GI, they can also remove pollutants from stormwater.

- Chapter 8.70 Stormwater Management and Discharge Control.
    - 8.70.080 Illicit Discharge. *The discharge of non-storm water discharges to the city storm sewer system is prohibited. All discharges of material other than storm water must be in compliance with a NPDES permit issued for the discharge (other than NPDES permit No. CA 0029921) and this chapter. Any non-storm water discharge that is not allowed under a NPDES permit or this chapter is an illicit discharge. Establishment, maintenance or continuation of any illicit discharge and appurtenant connection to the city storm sewer system is prohibited.*
    - 8.70.110 Reduction of Pollutants and Supplemental Runoff in Storm Water. *Any person engaged in activities which will or may result in pollutants or supplemental runoff entering the city storm sewer system shall undertake all practicable measures to reduce such pollutants or supplemental runoff. Examples of such activities include […] discharge of storm water detained through the use of detention facilities designed to change the rate of storm water flow from a development, or alteration of site runoff characteristics due to impervious pavements, structural modifications or landscaping alterations. The following minimal requirements shall apply:*
        - *D. Best Management Practices for Development and Construction. […] The city may establish controls on the volume and rate of storm water runoff from new developments and redevelopments as may be appropriate to minimize the discharge and transport of pollutants or supplemental runoff.*
        - *E. Compliance with Best Management Practices. When best management practices, plans, programs, guidelines or requirements have been adopted by the city for any activity, operation or facility which may cause or contribute to storm water pollution or contamination and/or discharge of non-storm water or supplemental runoff to the storm water system, every person undertaking such activity or operation, or owning or operating such facility shall comply with such plans, programs, guidelines or requirements as may be identified by the city.*

In addition, the City is in the process of amending the Stormwater Management and Discharge Controls section of the Municipal Code to strengthen the connection between the Municipal Code and the GI Plan and the legal authority to implement the GI Plan. The City intends to add new definitions to define the GI Plan and update BMPs to include GI as a strategy to capture pollutants. The amendment is tentatively scheduled to be completed in 2020.

10.3 Maintenance Programs and Policies

An effective maintenance program helps ensure that GI measures continue to perform as designed. Compared to conventional "gray" pipe-based stormwater facilities, GI measures are much more

maintenance-intensive, and their performance depends on the level of maintenance effected. A successful maintenance program has three (3) key elements: (A) consideration of maintenance issues during design of GI measures, (B) development of an Operation and Maintenance (O&M) agreement, and (C) implementation and enforcement of this O&M agreement.

The City is responsible for ensuring that storm sewer system components within the City's right-of-way, such as conveyance pipes, manholes, catch basins, GI measures, and other BMPs, are maintained and in good working order. Maintenance of these measures falls under the City's standard operating procedures for stormwater assets. **Additional information about maintenance of stormwater treatment measures is provided in the *SMCWPPP Green Infrastructure Design Guide,* Chapter 6.**

Most stormwater facilities located in the City of Millbrae are owned and maintained by private property owners—not the City of Millbrae. These property owners include, but are not limited to, homeowners associations (HOAs), property management companies, school districts, commercial/industrial site owners, and residential homeowners. They are responsible for the care and management of their facilities and are expected to conduct regular stormwater inspections.

To ensure successful maintenance of installed GI measures on development projects, the City requires the project proponent to sign a statement accepting responsibility for operation and maintenance through an O&M Agreement. Through such an agreement, the project proponent accepts responsibility for O&M of the installed GI measures until such responsibility is legally transferred to another entity. Acceptance of maintenance responsibility can be documented via another legally-enforceable agreement or mechanism allowed per Provision C.3.h. of the MRP. Assumption of responsibility for O&M may be documented through various means. Such means may include written text included in project deeds or conditions, covenants and restrictions (CCRs) for multi-unit residential projects that require the homeowner's association, or, if there is no association, each individual owner, to assume responsibility for the O&M of the installed GI measures.

The minimum requirements of any O&M Agreement are listed below:

- Full description of the stormwater treatment measures to be maintained;
- An O&M Plan describing the schedule for maintenance;
- Provisions for access by SFRWQCB staff, mosquito and vector control agency staff, and City staff;
- Requirements for property owner(s) to maintain the function of the stormwater treatment system(s) and, if applicable, hydromodification management control(s); and
- Mechanism for denoting that O&M responsibilities "run with the land" (that is, are conveyed to the new owner when a property is transferred).

The City has developed a Business Inspection Plan (BIP) and Enforcement Response Plan (ERP) describing the process by which the City inspects GI measures on development projects for enforcement of proper installation and maintenance.

10.4 Implementation of Public Green Infrastructure

10.4.1 Internal Policies that Support GI Implementation

The City maintains an ongoing list of prioritized GI opportunities, based on a screening of its CIP, as discussed in Chapter 4. This list is updated annually with new opportunities. The City will strive to incorporate GI on the following types of projects:

- New construction and substantial upgrades to City facilities—including public buildings, offices, stations, parking lots, and corporation yards— which the City determines to have GI potential.
- Transportation projects for which the City is a sponsor or participant, including roadway widening or reconstruction, streetscape improvements, "complete streets" projects, traffic calming, safe routes to schools, and other projects that involve roadway reconfiguration which the City determines to have GI potential.
- Storm drain capacity improvement or reconfiguration projects which the City determines to have GI potential.
- Parks improvements projects which the City determines have GI potential.

When a project is found to be Provision C.3 Regulated, measures will be installed in accordance with the Provision C.3 requirements of the MRP. Otherwise, alternative sizing criteria may be used, as discussed in Section 6.3.3.

If a project is reviewed for GI potential and it is found that implementation of GI is infeasible, the reasons for infeasibility will be documented, and the project removed from the City's map and list of prioritized projects.

10.4.2 Early Project Implementation

A review of the City's upcoming CIP Projects revealed that the majority of the projects are identified as having no GI potential, were too late to change to incorporate GI, or were classified as maintenance projects. Therefore, it appears that it will be difficult for the City to readily incorporate GI into the current CIP; however, the City will continue to reassess its CIP for GI potential.

During the development of this GI plan, the City has also begun exploring various GI opportunities which are appropriate to the context and character of the City.

These opportunities include:

- **San Anselmo Green Street Project.** The San Anselmo Green Street project will incorporate stormwater curb extensions, which shortens pedestrian crossing distances, calms traffic, and infiltrates stormwater runoff through the integrated bioretention areas. The project limits are San Anselmo Avenue from the Millbrae / San Bruno City limits to Landing Lane.

- **Richmond and Laurel Safe Routes to School and GI Pilot Project.** The proposed Laurel/Richmond Intersection Safe Routes to School project contains curb extensions (also called bulb-outs) that will provide pedestrians with additional space at key walking/waiting locations while reducing the walking distance from curb to curb. Bioretention areas will be incorporated within the curb extensions, which will treat the stormwater runoff from the surrounding impervious surfaces (street, curbs, etc.).
- **Millbrae History Museum Landscape Improvements.** This project involves landscaping improvements to the Millbrae History Museum site. The project includes a bioretention area.
- **Community Center Redevelopment.** In February of 2019, Council adopted a Master Plan and scope of design services to focus on the rebuild of the Community Center. This project will likely be C.3 regulated and will therefore incorporate GI measures.

Concept sheets for selected prioritized projects, including a description and approximate schedule for completion, are included in Appendix D.

10.4.3 Workplan to Complete Prioritized Projects

MRP Provision C.3.j.i.(2)(j) requires each Permittee to complete the following:

> *"A workplan to complete prioritized projects identified as part of a Provision C.3.e. Alternative Compliance program or part of Provision C.3.j. Early Implementation."*

The schedule and early implementation concept sheet in Appendix E and the City's CIP serve as the initial workplan to complete prioritized projects. The City's list of prioritized projects will be continuously updated and will eventually include projects identified through the San Mateo Countywide SSMP.

10.5 Plan Updates Process

The GI Plan is intended to be a "living" document, periodically updated to reflect the outcomes of the City's adaptive management process, adjusting to reflect lessons learned, and used to track GI implementation progress. The City may choose to regularly update the plan alongside CIP updates or alongside other similar policy updates (i.e., every 5 years), but there is no requirement that the GI Plan be updated. The text of the GI Plan need not necessarily be updated in the future; however, as time progresses, the City may reassess the adequacy of its tools or implementation strategies to secure achievement of GI Plan milestones. Table 19 proposes a preliminary schedule for when various elements of the GI Plan will be revisited. The City may change or modify this schedule without updating this section.

Table 19. *Green Infrastructure Plan Update Schedule.*

GI Plan Implementation Element	GI Plan Reference Section	What will be updated	Update Schedule
GI Milestones Progress	Chapter 3.0, GI Milestones	Tracking of progress towards meeting GI milestones	**Annually.** This will be tracked via the City's internal database until 2021, or when the San Mateo Countywide SSMP is developed.
Capital Improvement Program Screening	Chapter 4.0, Project Identification and Prioritization	City's internal screening database	**Every two years** in the CIP Cycle, and mid-cycle as applicable.
Tracking of GI Projects	Chapter 5.0, Project Tracking	City's internal database and public GI map	As needed (**annually**, at a minimum).
Tracking of GI Projects	Chapter 5.0, Project Tracking	Chapter 5.0, Project Tracking	**2021**, or when the San Mateo Countywide SSMP is developed.
Guidelines and Specifications	Chapter 6.0, Guidelines and Specifications	GI Guidelines and Standards	**Every 5 years**, the City will reassess the applicability of the Countywide GI Guidelines and Standards and review the potential for updating City-specific standards and details.
Planning Document Updates	Chapter 7.0, Integration with Other Planning Documents	Section 7.6, Future Updates	**2021**, or when planning document modifications are complete.
Funding Options	Chapter 8.0, Funding Options	Section 8.3, Funding Strategies	Revisit **every 5 years** to assess whether funding strategies are adequate.
Outreach and Education	Chapter 9.0, Outreach and Education	Internal outreach and education strategy	Participate at the Countywide level (estimated **2 times per year**) to support outreach and education about GI.
Programs and Policies	Chapter 10.0, Implementation Approach	Standard Operating Procedures, Municipal Code, and Policies	Revisit **every 5 years** to assess whether implementation approach is adequate.

GLOSSARY

Several terms used in this green infrastructure may be unfamiliar to readers. For the reader's convenience, definitions of key terminology have been adapted from various sources in the table below.

Best Management Practices (BMPs)

Schedules of activities, prohibitions of practices, maintenance procedures, and other management practices to prevent or reduce stormwater pollution.

Bioretention Area

A type of low impact development treatment measure designed to have a surface ponding area that allows for evapotranspiration and filters water through 18 inches of engineered biotreatment soil. After the water filters through the engineered soil, it encounters a 12-inch layer of rock in which an underdrain is typically installed to convey treated water to the storm drain system. Also known as a "Stormwater Planter".

Bioswale

Also known as a "bioretention swale", a bioswale is a linear bioretention area.

Biotreatment

A type of low impact development treatment allowed under Provision C.3.c. of the MRP. Biotreatment areas must be designed to have a surface area no smaller than what is required to accommodate a 5 inches/hour stormwater runoff surface loading rate and must use biotreatment soil as specified under the MRP (Appendix K of the C.3 Regulated Projects Guide).

Bulb-outs

Synonymous with "Curb Extension". Bulb-outs are extensions of the curb, gutter, and sidewalk into the roadway, typically located at street crossings such as intersections or mid-block crosswalks. They are a traffic calming and pedestrian safety enhancement measure that reduce the crossing distance for pedestrians. Stormwater curb extensions are curb extensions that incorporate stormwater treatment.

C.3

Provision of the Municipal Regional Stormwater NPDES Permit (MRP) that requires each municipality to control the discharge of stormwater pollutants and erosive flows from land development projects (C.3 Regulated Projects). It is often used as a shorthand term for green infrastructure measures that are required for new development and redevelopment sites over which a municipality has jurisdiction.

C.3.d Amount of Runoff

The water quality design flow or design volume of runoff, as determined by the methodologies described in Provision C.3.d of the MRP, required to be treated for compliance with C.3.

Complete Streets

A complete street is a transportation facility that is planned, designed, operated, and maintained to provide safe mobility for all users, including bicyclists, pedestrians, transit vehicles, truckers, and motorists, appropriate to the function and context of the facility. Every complete street looks different, according to its context, community preferences, the types of road users, and their needs.

Detention Basin

Detention is the process of providing temporary storage of stormwater runoff in ponds, vaults, bermed areas, or depressed areas to allow treatment by sedimentation and metered discharge of runoff at reduced peak flow rates. In more urban situations, detention can also be provided by using rock filled trenches or suspended paving systems directly adjacent to other treatment measures to allow them to store water and treat it over a longer period.

Directly Connected Impervious Area

The area covered by a building, impermeable pavement, and/or other impervious surfaces, which drains directly into the storm drain without first flowing across permeable land area (e.g., turf buffers).

Dry Weather Runoff

Runoff that occur during period without rainfall. In a natural setting, dry weather runoff result from precipitation that infiltrates into the soil and slowly moves through the soil to the creek channel. Dry weather runoff in storm drains may result from human activities, such as over-irrigation.

Evapotranspiration

Evaporating water into the air directly or through plant transpiration.

Fiscal Year

A fiscal year is twelve consecutive months ending on the last day of June.

Flow-through Planter

A flow-through planter is a contained landscape area designed to capture and retain stormwater runoff. It is fully lined and connected via an underdrain to a stormwater system. It does not allow for infiltration to the native soils below.

Green Building

Green building is the practice of creating structures and using processes that are environmentally responsible and resource-efficient throughout a building's life-cycle from siting to design, construction, operation, maintenance, renovation and deconstruction.

Green Gutters

Green gutters help capture and slow stormwater runoff within very arrow and shallow landscaped areas.

Green Infrastructure

Green infrastructure comprises a range of natural and built approaches to stormwater management–such as rain gardens, bioretention, and permeable paving–that mimic natural systems by cleaning stormwater and letting it absorb back into the ground. Green infrastructure could reduce the amount of runoff that enters the traditional piped stormwater system below ground.

Green Roof

Green roofs are landscaped systems placed on rooftops designed to capture, treat, and store rainfall. The treated rainfall is directed to the storm drain system or is allowed to evaporate back into the air.

Green Streets

Green Streets are defined as streets that maximize permeable surfaces, tree canopy, and landscaping elements in order to divert stormwater from the sewer system; filter and reduce the amount of polluted stormwater entering rivers and streams; increase urban greenspace; improve air quality and reduce ambient air temperature; and improve watershed health. There is some evidence that Green Streets also improve pedestrian and bicycle safety and promote travel by these modes.

Graywater

Uncontaminated wastewater from sinks, bathtubs, and washing machines. The 2013 California Plumbing Code, effective January 1, 2014, includes rainwater harvesting and graywater requirements, codes, and treatment standards.

Gray Infrastructure

Gray infrastructure is defined as traditional brick, mortar, and concrete construction to remove stormwater from its source and transport it to a downstream outfall or treatment facility.

Groundwater Recharge

Groundwater recharge is the process in which surface flows are stored for a period sufficient for water to percolate into the soil or groundwater table.

Hydromodification

The modification of a stream's hydrograph, caused in general by increases in flows and durations that result when land is developed (e.g., made more impervious). The effects of hydromodification include, but are not limited to, increased bed and bank erosion, loss of habitat, increased sediment transport and deposition, and increased flooding.

Impervious Surface

A surface covering or pavement of a developed parcel of land that prevents the land's natural ability to absorb and infiltrate rainfall /stormwater. Impervious surfaces include, but are not limited to, roof tops; walkways; patios; driveways; parking lots; storage areas; impervious concrete and asphalt; and any other continuous watertight pavement or covering. Landscaped soil and pervious pavement, including pavers with pervious openings and seams, underlain with pervious soil or pervious storage material, such as a gravel layer sufficient to hold at least the MRP C.3.d volume of rainfall runoff, are not impervious surfaces.

Infiltration

The process of slowing, filtering, and soaking stormwater runoff into native soil. Greater infiltration can often be achieved, as necessary, by employing a specified biotreatment soil mix and aggregate storage prior to infiltration into native soil.

Infiltration Trench

Infiltration systems are underground facilities and structures designed to collect and temporarily store runoff, such as a gravel filled trench, pipe or vault, and allows the water to infiltrate into surrounding subsurface soils.

Low Impact Development (LID)

A sustainable practice that benefits water supply and contributes to water quality protection. Unlike traditional storm water management, which entails collecting and conveying storm water runoff through storm drains, pipes, or other conveyances to a centralized storm water facility, LID focuses on using site design and storm water management to maintain the site's pre-development runoff rates and volume. The goal of LID is to mimic a site's predevelopment hydrology by using design techniques that infiltrate, filter, store, evaporate, and detain runoff close to the source of rainfall.

Municipality

A municipality is a city, county, city and county, special district, a public agency of the State of California, and any department, division, public corporation, or public agency of this State or two or more entities acting jointly, or the duly constituted body of an Indian reservation or rancheria.

Non-Potable Water Supply

Any water, including reclaimed water, not meeting current potable water standards. Water which is suitable for beneficial uses excluding human consumption. Specifically excluded from this definition is "graywater".

Percolation
Percolation is the internal drainage rate of a substrate (in mm/hr) in the same way that infiltration indicates the capacity to infiltrate water into the surface of the substrate.

Pervious Surface
A natural, landscaped, or permeable hardscape (e.g., turf block, brick, natural stone, cobbles, gravel) that allows surface runoff to infiltrate into underlying soils.

Polychlorinated Biphenyls
PCBs are a group of man-made organic chemicals consisting of carbon, hydrogen and chlorine atoms. The number of chlorine atoms and their location in a PCB molecule determine many of its physical and chemical properties. PCBs have no known taste or smell, and range in consistency from an oil to a waxy solid.

PCBs belong to a broad family of man-made organic chemicals known as chlorinated hydrocarbons. PCBs were domestically manufactured from 1929 until manufacturing was banned in 1979. They have a range of toxicity and vary in consistency from thin, light-colored liquids to yellow or black waxy solids. Due to their non-flammability, chemical stability, high boiling point and electrical insulating properties, PCBs were used in hundreds of industrial and commercial applications.

Public Right-of-Way
Public right-of-way is defined as the right of passage held by the public in general to travel on roads, freeways, and other thoroughfares.

Rainwater Harvesting
Rainwater harvesting is defined as a method for harvesting (collecting) rainwater and/or stormwater for subsequent use. Storage facilities can be above or below ground. Water stored in this way can be used to supplement or replace potable water for irrigation, toilet flushing, or other uses.

Regulated Project
A project which is regulated by the MRP under Provision C.3, based on established thresholds. Since 2006, private or public projects that create or replace 10,000 square feet or more of impervious surface have been deemed Regulated Projects under Provision C.3 of the MRP (with certain exceptions; for example, single family homes not constructed as part of a larger project are exempt). Effective December 1, 2011, the threshold was reduced from 10,000 to 5,000 square feet for uncovered parking areas, restaurants, auto service facilities, and retail gasoline outlets. Effective 1/1/16, Under MRP 2.0, all projects including single-family dwellings with ≥ 2,500 ft2 and < 10,000 ft2 of impervious surface must install one or more of six (6) specified LID site design measures.

Special Projects
Certain types of smart growth, high density and transit-oriented development projects that are allowed, under MRP Provision C.3.e.ii of the MRP, to receive LID treatment reductions.

Sustainable Streets
Sustainable streets are multimodal rights of way designed and operated to create benefits relating to movement, ecology and community that together support a broad sustainability agenda embracing the three E's: environment, equity, and economy.

Vegetated Swale
Shallow landscaped areas designed to capture, convey, and potentially infiltrate stormwater runoff as it moves downstream.

Wasteload Allocation
A portion of a receiving water's TMDL that is allocated to one of its existing or future point sources of pollution.

Watershed
A watershed is defined as the area where precipitation drains to a common waterway, such as a stream, lake, estuary, wetland, or the ocean.

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GREEN INFRASTRUCTURE PLAN APPENDICES

A. Capital Improvements Program GI Potential Screening Flowcharts

B. GI Project Prioritization Maps

C. Development Review Flowcharts

D. Early Project Implementation Schedule and Concept Sheets

APPENDIX A: Capital Improvements Program GI Potential Screening Flowcharts

Part 1: Initial Screening	
No Potential	**Eliminate from List**
No exterior work (e.g., interior remodel)	
Exterior building upgrades or equipment	
Development or funding of municipal programs	
Technical studies, data collection, or training	
Construction of streetlights and traffic signals	
Minor bridge and culvert repairs/replacement	
Non-stormwater utility projects	
Equipment purchase or maintenance	
Irrigation system installation, upgrades, or repairs	
Too Late to Change	
Project has gone to bid or is under construction	
Project is too far along in design stage to make changes (up to Agency judgment based on schedule and budget considerations)	
Too Early to Assess	**Eliminate from list, but reconsider next FY**
Not enough information to assess project for GI potential	
Maintenance/Minor Construction	**Eliminate from List**
Project is for maintenance purposes only or is minor in nature, and maintains the existing lines, grades, and capacity of the original facility. In addition, the project is not concentrated in one location and includes multiple work orders throughout various locations in the City. For example:	
1. Pavement maintenance/replacement	
2. Sidewalk, curb and gutter repairs	
3. ADA ramps and other improvements	
Project meets the above criteria but includes at least 5,000 SF of impervious surface created or replaced in a single contiguous area.	**Move to Part 2**
All other projects	

Part 2: Assessment of GI Potential	
Project involves: Alternations to existing building's roof drainage New/replaced pavement or drainage structures Concrete work Landscaping, including tree planting Streetscape and intersection improvements	**Move to Part 3**
Project is of these retrofit types: Road Diet Bike/Ped Facilities Pavement Reconstruction Street Beautification Tree Planting Park/Landscaping Retrofit Drainage Reconstruction Parking Lot Building	
Project is a master planning document, such as a Bike/Ped Master Plan, Parks Master Plan, or Storm Drain Master Plan	Assess possibility of integrating green infrastructure into these Master Planning Documents. **Associated individual projects move to Part 3**
Project is subject to C.3 requirements	Project must include GI per Provision C.3 Requirements.
None of the above categories apply	Individually assess for GI Potential. If no potential exists, document why GI is impracticable.

Part 3: Preliminary Design

Step 1: Information Collection / Reconnaissance

- Locate roof leaders and discharge points.
- Look for opportunities to substitute pervious pavements for impervious pavements.
- Identify available landscaped or paved areas adjacent or downgradient from paved or roof areas.
- Locate nearby storm drains.
- Assess potential for infiltration and groundwater depth.
- Assess potential for connection of underdrain (typ. 2-2.5 below bioretention area surface).

Step 2: Preliminary Sizing and Drainage Analysis

- Delineate drainage areas.
- Identify pathways to direct drainage from roof and pavement areas to potential GI facilities.
- Preliminary sizing of GI facilities.

Step 3: Barriers and Conflicts

- Identify barriers and conflicts:
  - Utility conflicts.
  - Property ownership.
  - Availability of water supply for irrigation.
  - Integration of GI features vs. "add-on".
- Presence of barriers or conflicts does not necessarily mean GI is infeasible but may affect cost or public acceptance.

Step 4: Budget and Schedule

- Budget considerations:
  - Sources of funding that might be available for GI.
  - Potential savings achieved by integrating with other planned projects (e.g. bike/ped, beautification, etc.) or reducing cost of "gray" drainage facilities.
- Schedule considerations:
  - Constraints on schedule due to regulatory mandates, grant requirements, etc.
  - Whether schedule allows time for any design changes needed to incorporate GI.
  - Whether schedule allows time to align separate funding for GI features.

Step 5: Results of Assessment

- Does the project have GI potential?
  - Consider results of previous steps.
  - Consider ancillary benefits of GI.
- Does it make sense to include GI in this project, if funding was available for the incremental costs of GI elements?

APPENDIX B: GI Project Prioritization Maps

a. **Water Resources**

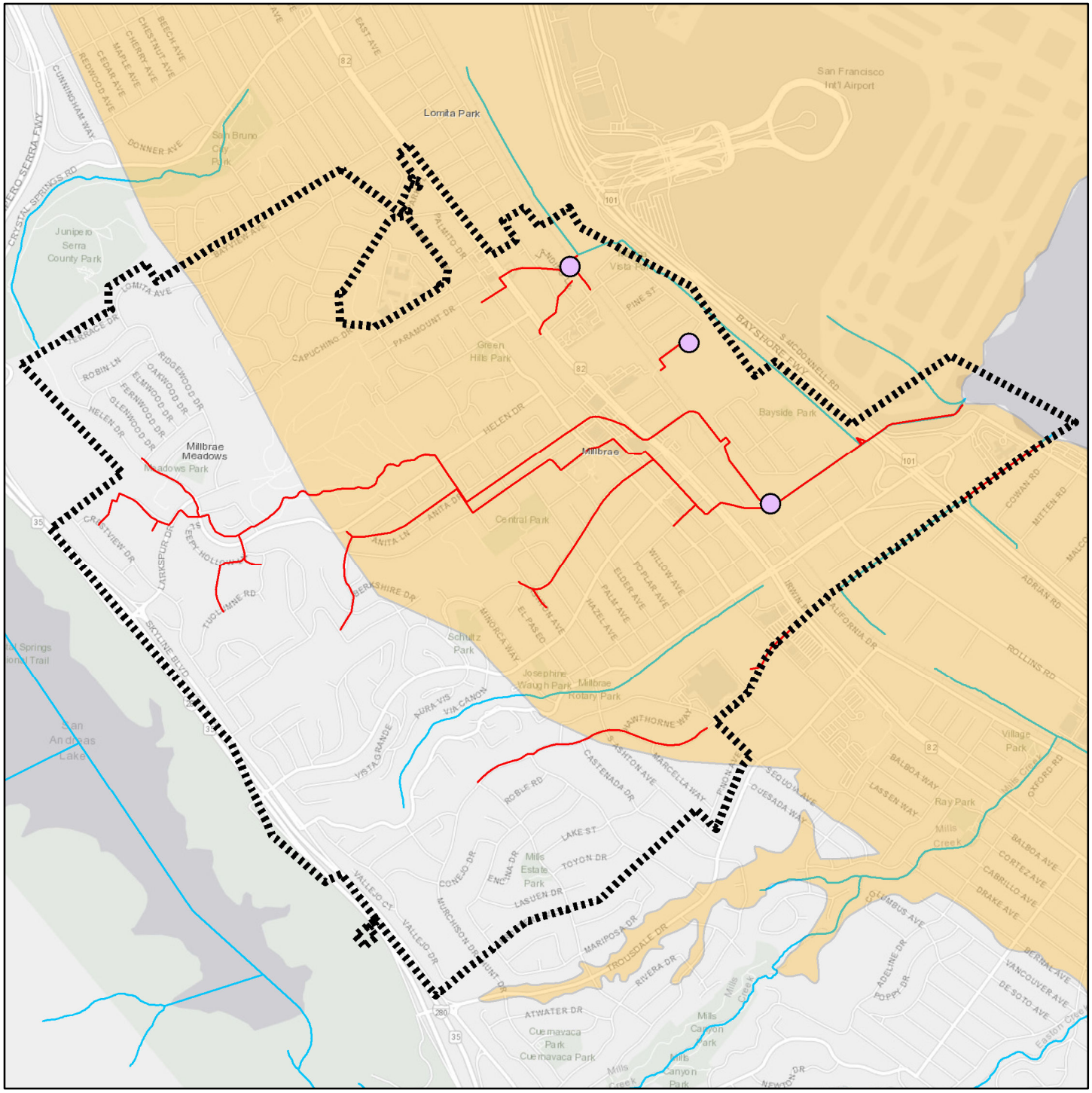
b. **FEMA 100-yr Flood Plain**

c. **Sea Level Rise**

d. **Prioritized Green Streets Projects**

e. **Prioritized LID and Regional Projects**

f. **Existing and Potential Green Infrastructure Projects in Millbrae**



City of Millbrae: Water Resources

Legend

- City Boundary
- Streams
- Storm Drain Outfalls
- Storm Drains
- Groundwater Basins [1]

[1]San Mateo Countywide Water Pollution Prevention Program (SMCWPPP). (2017, February). *Stormwater Resource Plan for San Mateo County.* Prepared by Paradigm Environmental & Larry Walker Associates, Inc. City/County Association of Government, SMCWPPP, Redwood City, CA. http://ccag.ca.gov/srp/

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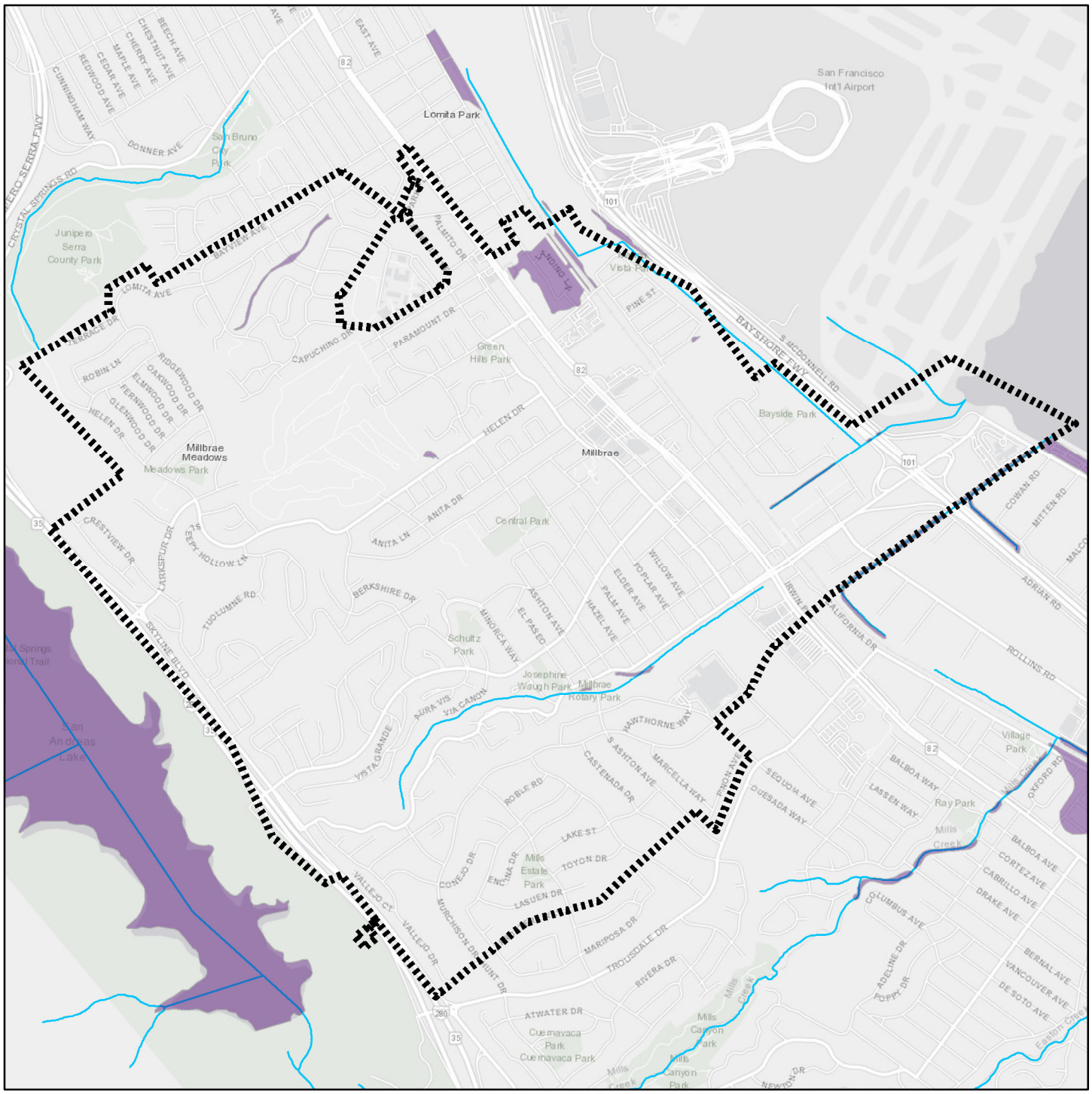

City of Millbrae: FEMA 100-yr Flood Plain

Legend

- City Boundary
- Streams
- FEMA 100-yr Flood Plain [1]

[1]San Mateo Countywide Water Pollution Prevention Program (SMCWPPP). (2017, February). *Stormwater Resource Plan for San Mateo County.* Prepared by Paradigm Environmental & Larry Walker Associates, Inc. City/County Association of Government, SMCWPPP, Redwood City, CA.
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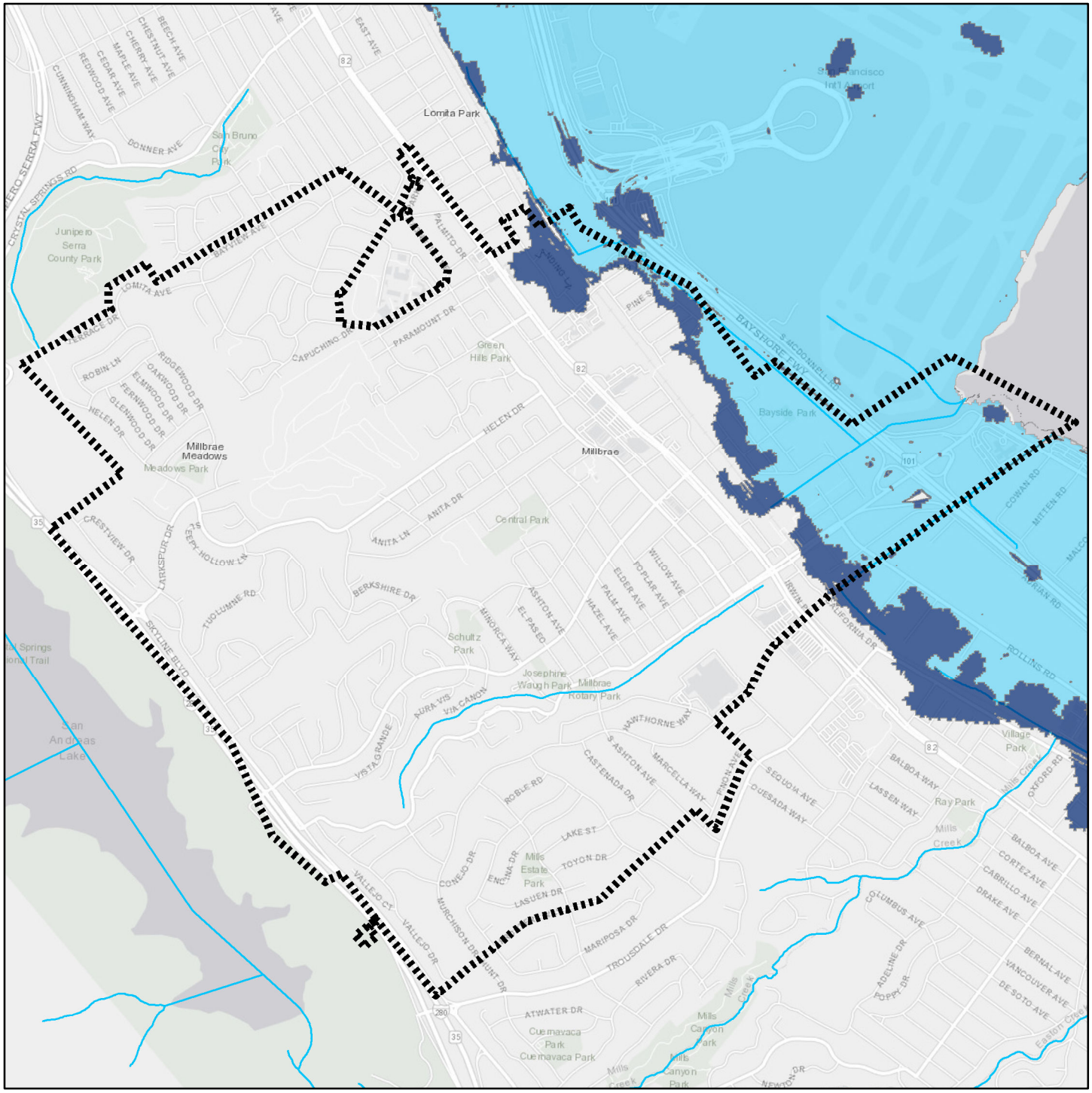

City of Millbrae: Sea Level Rise

Legend

- City Boundary
- Streams
- Sea Level Rise 100 [1]
- Sea Level Rise 200 [1]

[1]San Mateo Countywide Water Pollution Prevention Program (SMCWPPP). (2017, February). *Stormwater Resource Plan for San Mateo County.* Prepared by Paradigm Environmental & Larry Walker Associates, Inc. City/County Association of Government, SMCWPPP, Redwood City, CA.
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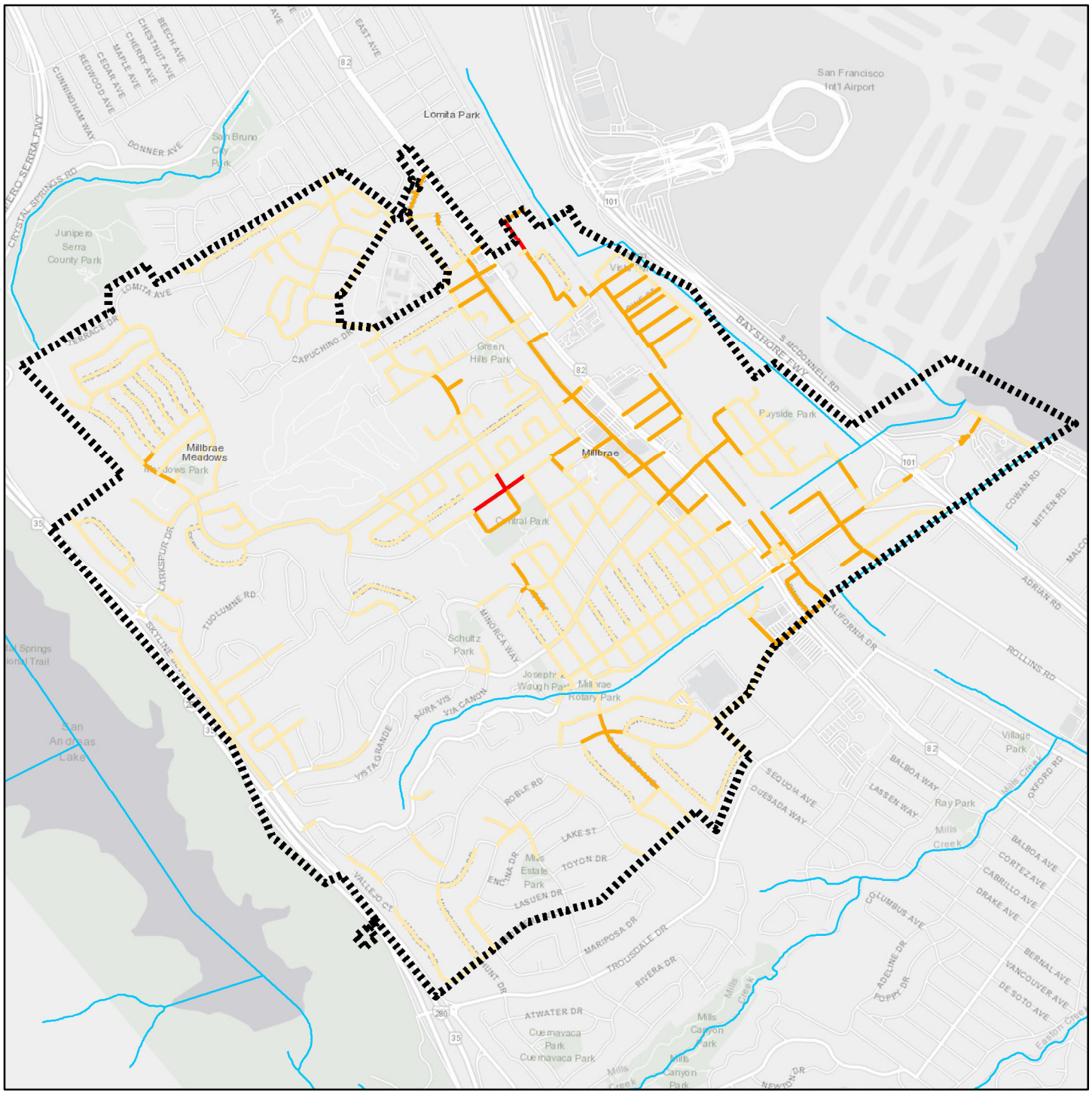

City of Millbrae: Prioritized Green Streets

Legend

- City Boundary
- Streams

Green Streets Prioritized [1]

- Low Priority
- Medium Priority
- High Priority

[1]San Mateo Countywide Water Pollution Prevention Program (SMCWPPP). (2017, February). *Stormwater Resource Plan for San Mateo County.* Prepared by Paradigm Environmental & Larry Walker Associates, Inc. City/County Association of Government, SMCWPPP, Redwood City, CA. http://ccag.ca.gov/srp/

Note: The Stormwater Resource Plan for San Mateo County identified and prioritized green streets based on screening and prioritization criteria applied Countywide. This data will be further reviewed, refined, and added to as the Green Infrastructure Program develops with agency-specific knowledge. Part of this refinement effort will take place through the Sustainable Streets Master Plan (estimated 2021 completion).

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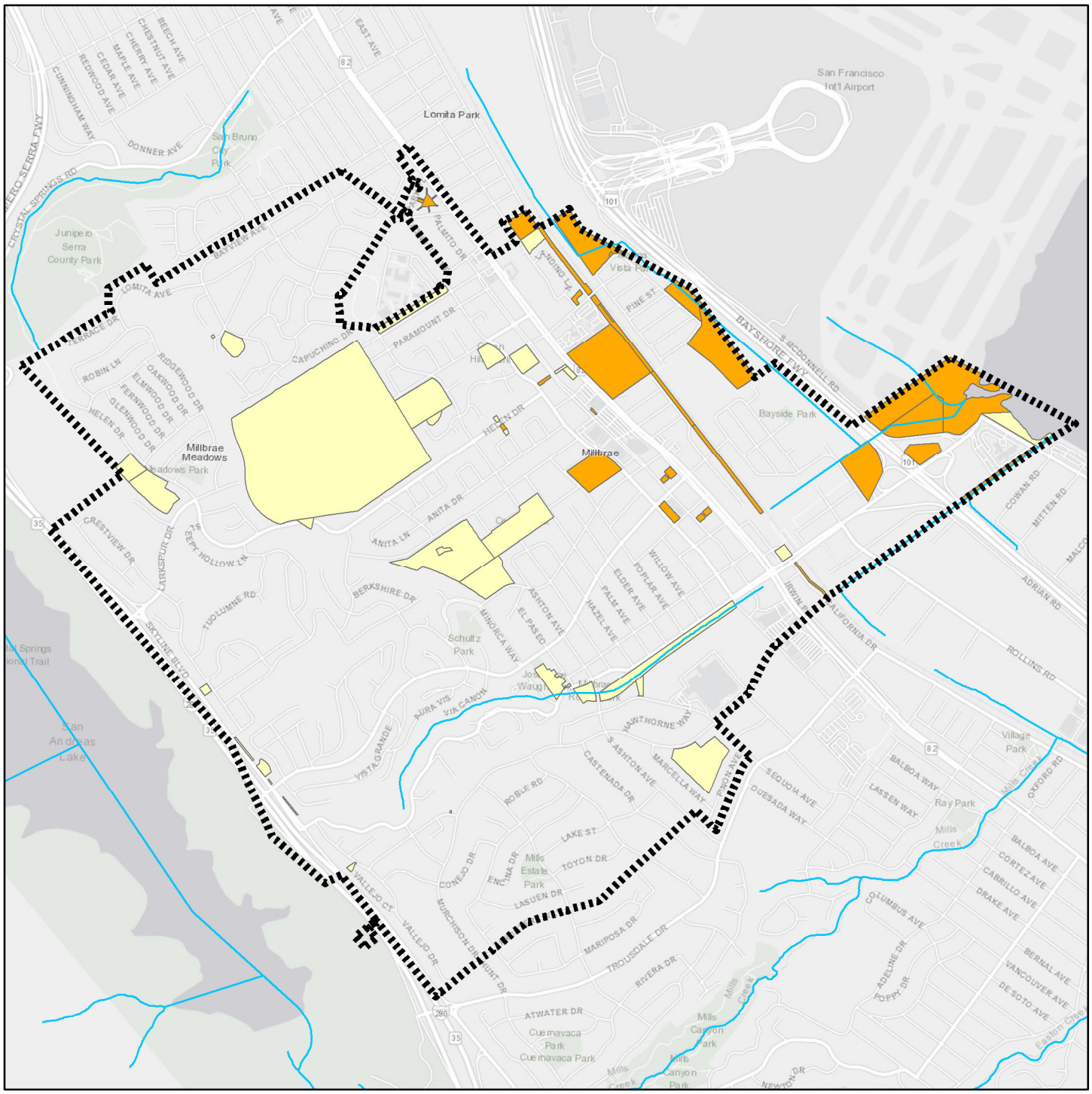

City of Millbrae: Prioritized LID and Regional Projects

Legend

- City Boundary
- Streams

LID Projects Prioritized [1]

- Low Priority
- Medium Priority
- High Priority
- Regional Project Drainage Areas

[1]San Mateo Countywide Water Pollution Prevention Program (SMCWPPP). (2017, February). *Stormwater Resource Plan for San Mateo County.* Prepared by Paradigm Environmental & Larry Walker Associates, Inc. City/County Association of Government, SMCWPPP, Redwood City, CA. http://ccag.ca.gov/srp/

Note: The Stormwater Resource Plan for San Mateo County identified and prioritized low impact development (LID) and Regional Projects based on screening and prioritization criteria applied Countywide. This data will be further reviewed, refined, and added to as the Green Infrastructure Program develops with agency-specific knowledge. Part of this refinement effort will take place through the Sustainable Streets Master Plan (estimated 2021 completion).

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City of Millbrae Green Infrastructure

No.	Project
1	Green Hills Country Club Golf Course*
2	Millbrae Estates
3	San Anselmo Green Street Project
4	El Camino Real Specific Plan
5	Millbrae Library
6	Laurel/Richmond Intersection SRTS/GI Project
7	Taylor Middle School SRTS Project
8	Millbrae Xeriscaping
9	Millbrae City Hall
10	Millbrae History Museum
11	Proposed Multi-Family Dwelling
12	30 Hermosa Condominiums
13	Millbrae Serra Station (TOD #1)
14	BART Station Parking Lot
15	Gateway at Millbrae Station (TOD #2)

*Project includes pre-MRP stormwater retention ponds for irrigation supply.

Legend

- City Boundary
- Streams
- Private, Existing
- Private, Potential
- Public, Existing
- Public, Potential

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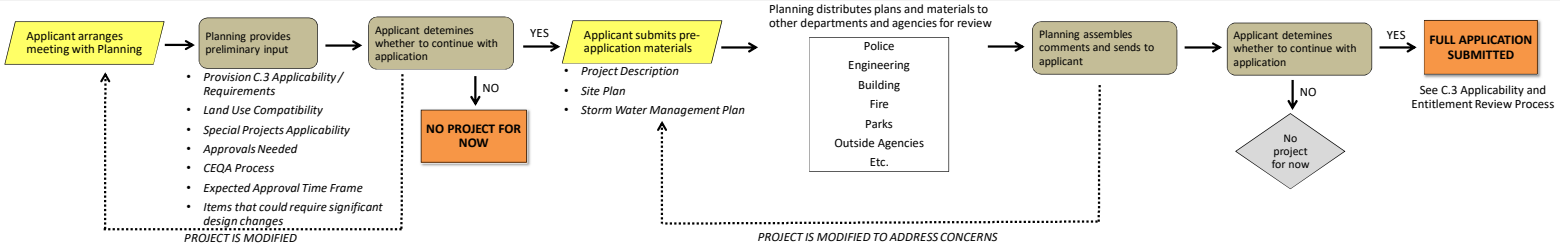
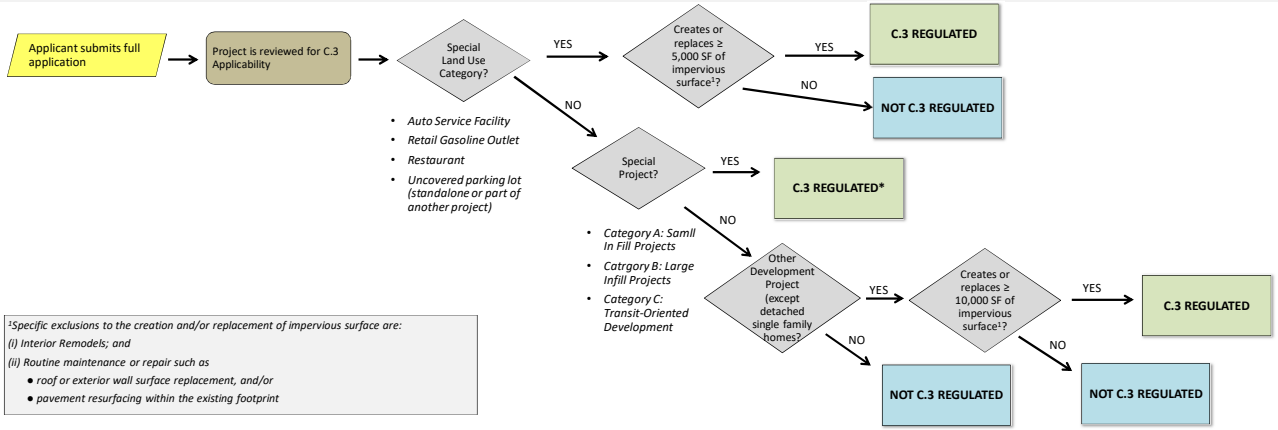
APPENDIX C: Development Review Flowcharts

DEVELOPMENT REVIEW PROCESS

Entitlement Pre-Application Review



Development and Redevelopment C.3 Applicability Review



[1]*Specific exclusions to the creation and/or replacement of impervious surface are:*
(i) Interior Remodels; and
(ii) Routine maintenance or repair such as
- *roof or exterior wall surface replacement, and/or*
- *pavement resurfacing within the existing footprint*

C.3 REGULATED PROJECT MEASURES

Applicant to complete the "C.3 and C.6 Development Review Checklist", and select appropriate:

- *Site Design Measures*
- *Source Control Measures*
- *Construction Best Management Practices*
- *Stormwater Treatment Measures*
- *Hydromodification Management Controls (if applicable)*

*Special Projects need to complete the Special Projects Worksheet

- Special Projects may be allowed to use non-lid treatment for 100% of the C.3.d amount of runoff

NON-C.3 REGULATED PROJECT MEASURES

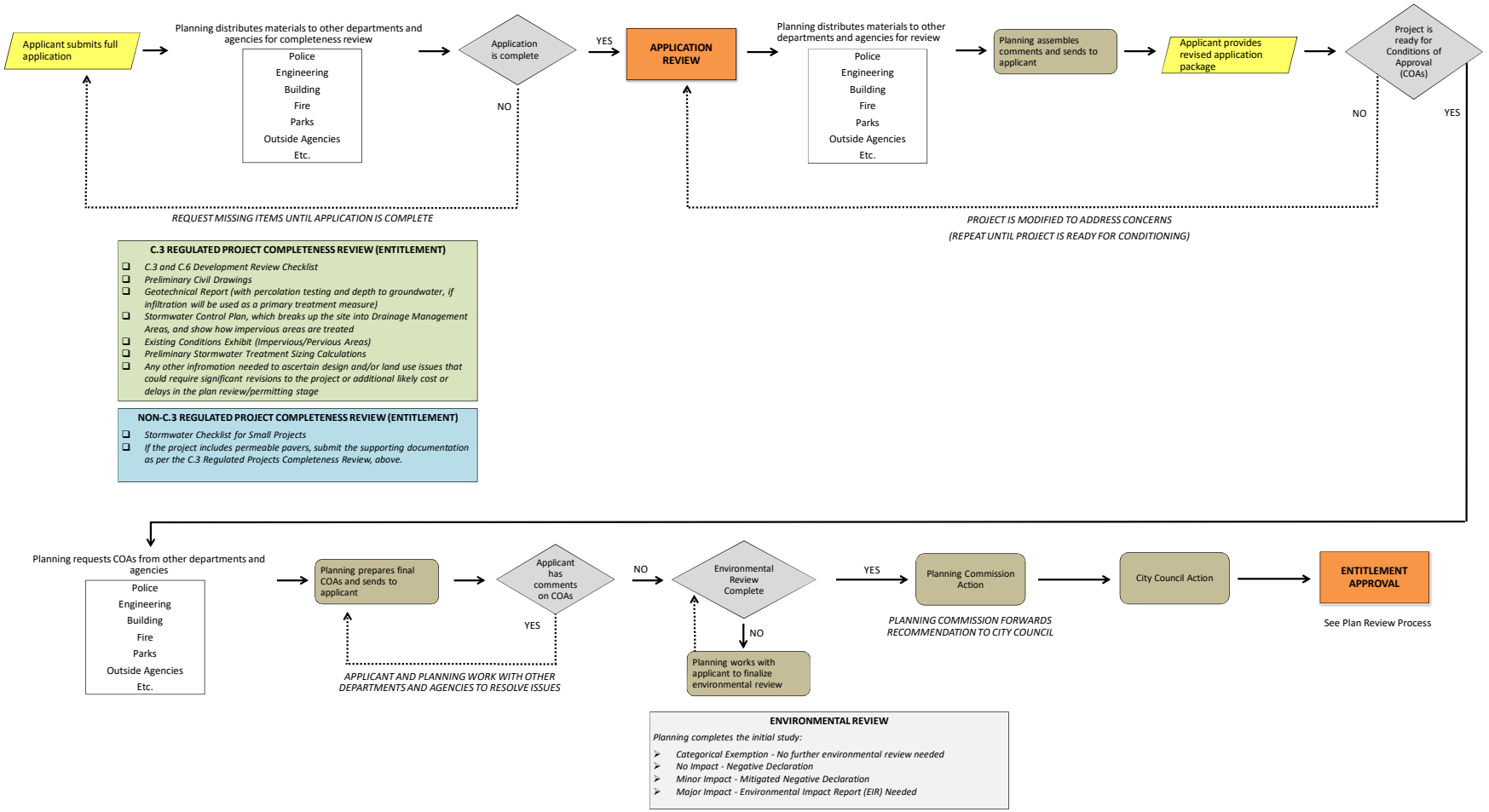
Applicant to complete the "Stormwater Checklist for Small Projects", and select appropriate:

- *Site Design Measures**
- *Source Control Measures*
- *Construction Best Management Practices*

**One or more site design measures are required for projects that create and/or replace 2,500 square feet or more of impervious surface. Otherwise, these measures are optional.*

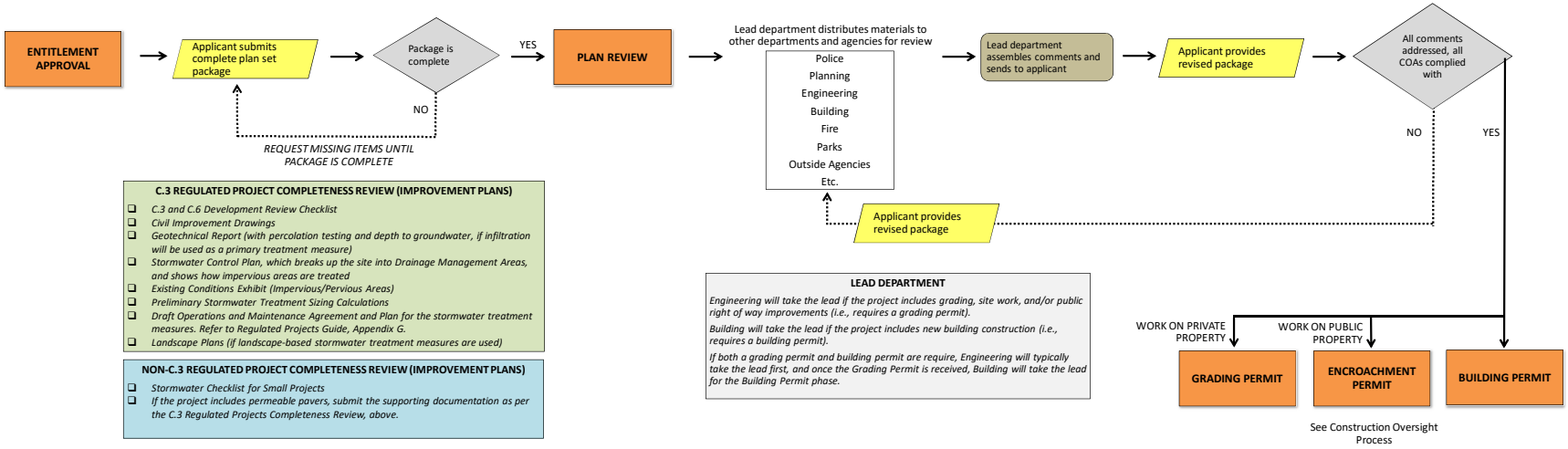
DEVELOPMENT REVIEW PROCESS

Entitlement Review

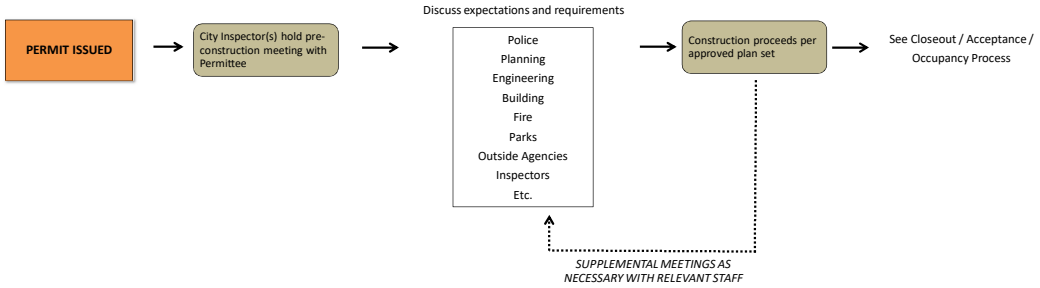


DEVELOPMENT REVIEW PROCESS

Plan Review



Construction Oversight



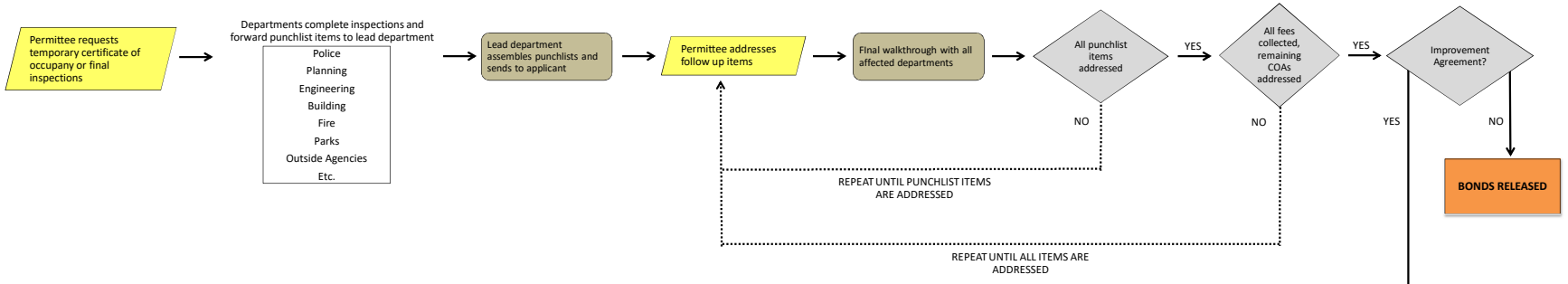
IN-PROGRESS C.3 REGULATED PROJECT INSPECTIONS

In-progress inspections of stormwater treatment measures are optional under the Municipal Regional Stormwater NPDES Permit (MRP), though are recommended to ensure the measures are constructed in accordance with the approved plan set. Any issues identified can be corrected in a timely fashion, well before project closeout. Inspections should occur at several stages of construction, for example:

- *Subgrade preparation*
- *Placement of material layers (filter fabric, subbase, base, soil, etc.)*
- *Installation of storm drain piping and structures*
- *Reinforcing steel and concrete formwork placement (if applicable)*
- *Installation of irrigation and planting*
- *After final landscaping*

DEVELOPMENT REVIEW PROCESS

Closeout / Acceptance / Occupancy



C.3 REGULATED PROJECT PUNCHLIST ITEMS

- ❑ *Final inspection performed for stormwater treatment measures and hydromodification management measures and found all measures to be constructed per plans and fully operational, with no observed issues*
- ❑ *As-built plans which fully reflect the field conditions*
- ❑ *Operations and Maintenance (O&M) Agreement, per local standards, has been reviewed and recorded*
- ❑ *O&M Plan, per Appendix G of the Regulated Projects Guide and local standards, has been reviewed and attached to the O&M Agreement*

NON-C.3 REGULATED PROJECT PUNCHLIST ITEMS

- ❑ *As-built plans which fully reflect the field conditions*
- ❑ *If the project includes permeable pavers, submit the C.3 Regulated Projects Punchlist Items, above.*

APPENDIX D: Early Project Implementation Concept Sheets

a. **Draft Schedule for Prioritized Projects**

b. **San Anselmo Green Street**

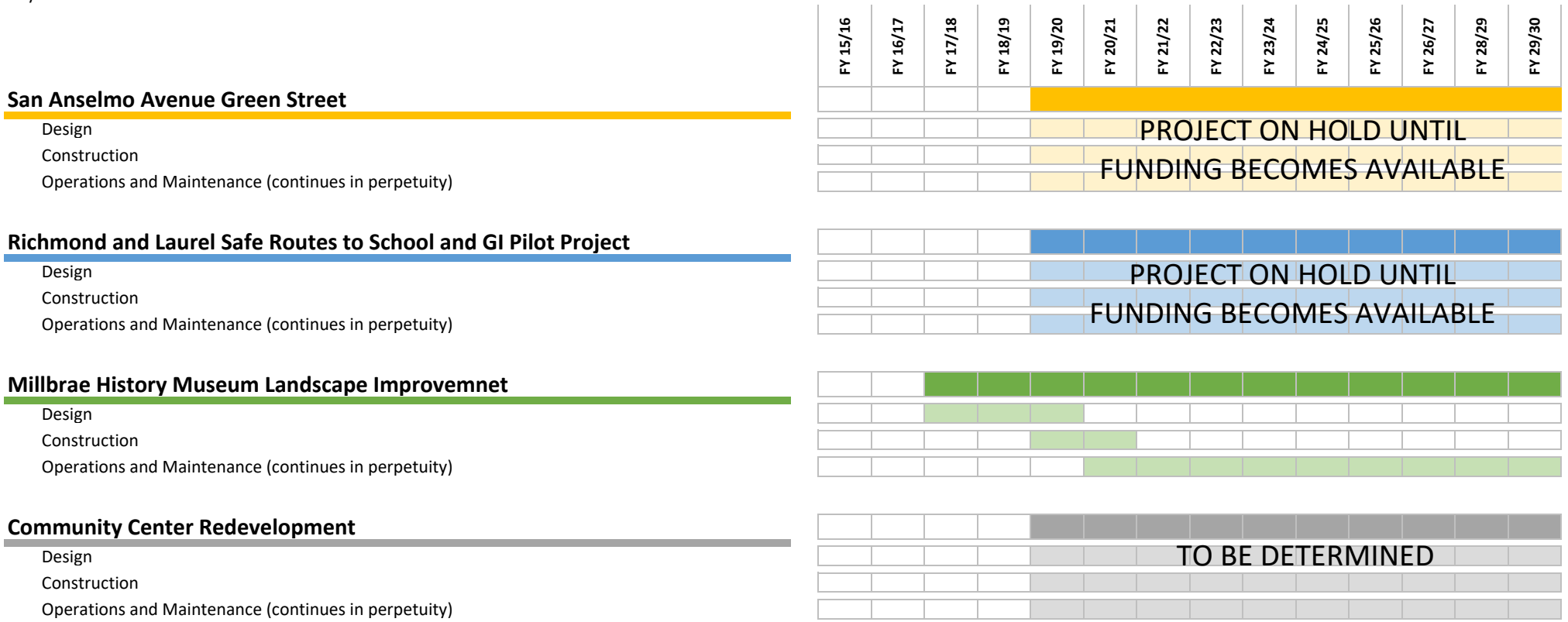
c. **Richmond and Laurel Safe Routes to School / GI Project**

d. **Millbrae History Museum Landscape Improvement**

e. **Community Center Redevelopment**

DRAFT SCHEDULE FOR PRIORITIZED GI PROJECTS

City of Millbrae



Site Information

Jurisdiction	City of Millbrae
Street Name	San Anselmo Ave
Bounding Streets	Santa Helena Ave / Landing Ln
Street Typology	High-Density Residential
Co-Located Project	Safe Routes to School – Lomita Park Elementary
Capture Area (acres)	3.68
Impervious Area (%)	65
85th Percentile Rainfall (in)	0.90
Generated Runoff (ac-ft)	0.3

Site Description:

The proposed project consists of green street improvements along San Anselmo Avenue between Santa Helena Avenue and Landing Lane and San Juan Avenue between San Anselmo and El Camino Real. The total street length is 1,150 feet. The site is considered high-density residential with limited space for parking. Curb extensions are recommended as the primary treatment type and must be placed to minimize loss of parking. Bulb-outs at the San Anselmo-San Juan pedestrian crossings will be implemented for stormwater capture and will integrate with the Safe Routes to School Program at the Lomita Park Elementary School.

The proposed improvements would capture a total of 0.27 acre-feet while providing flood risk mitigation, community enhancement, increased property values, safer pedestrian routes, and other multiple benefits.

DISCLAIMER: All elements of this conceptual design are planning-level. Locations of opportunities for placement of green infrastructure shown in the map are preliminary and subject to further site assessment and design. Percent imperviousness is based on best professional judgement. All design assumptions/parameters and cost estimates must be re-evaluated during the detailed design process.

Design Summary

Green Infrastructure Type	Design Width (ft)	Design Length (ft)	Capture Volume (ac-ft)
Bioretention (Curb Extension)	4	1,740	0.30

Cost Estimate

DESCRIPTION	QUANTITY	UNIT	UNIT COST	TOTAL
Excavation/Hauling	1,290	CY	$50.00	$65,000
Bioretention	6,960	SF	$25.00	$174,000
Curbs and Gutters	1,740	LF	$17.25	$30,000
			CONSTRUCTION SUBTOTAL	$269,000
Planning (20%), Mobilization (10%), Design (30%), Contingency (25%)				$229,000
			TOTAL COST	**$498,000**


Curb Extension on a Residential Street

Concept for a Green Street Retrofit for Stormwater Capture

Site: San Anselmo Avenue (City of Millbrae)

San Water Countywide Water Pollution Prevention Program

PARADIGM ENVIRONMENTAL

Prioritized Project: Richmond and Laurel Safe Routes to School and GI Pilot Project

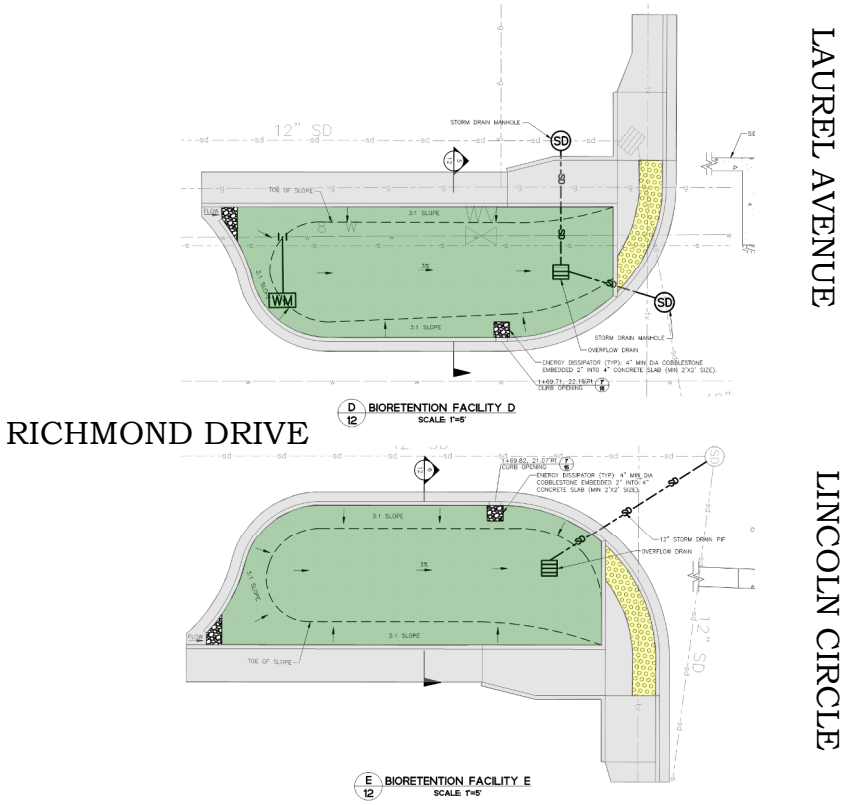


Image Source: Colorized version of 95% Project Plans developed by CSG Consultants Inc.

Site Information:

Location	785 Crestview Dr and 420 Poplar Avenue Millbrae, CA 94030
Capture Area	20,000 square feet
Impervious Area (%)	100%
Possible GI Measures	Stormwater curb extensions

Project Schedule:

Design of the project started in FY 2017/18, and the 95% project design was completed in December 2018. The project is currently on hold until funding becomes available for construction.

Project Cost:

The project cost is estimated to be $335,000. The project is currently unfunded.

Project Description:

Phase 2 of the Taylor Middle School Safe Routes to School and Green Infrastructure Pilot Project involves 650 square feet of stormwater curb extensions at Richmond Drive and Laurel Avenue. Improvements will also include a new high visibility crosswalk and ADA curb ramps. The median island will be reduced to allow additional crosswalk width.

This project was identified on the “Walk Audits” report by Paradigm Environmental. This project supports the City’s long term goal of providing safe walking routes to schools for students.

It is anticipated that educational signage would be provided, which can bring awareness to the general public regarding the benefits of green infrastructure.

Prioritized Project: Millbrae History Museum Landscape Improvement

Image Source: Millbrae Historical Society, http://www.millbraehs.org/millbrae-history-museum.html

Site Information:

Location	420 Poplar Avenue Millbrae, CA 94030
Capture Area	22,000 square feet
Impervious Area (%)	100%
Possible GI Measures	Bioretention Area

Project Schedule:

Design of the project started in FY 2018, with project completion by end of calendar year 2019.

Project Cost:

General Fund: $250,000 (FY18=$100k, FY19=$150k)

Project Description:

This project involves landscaping improvements to the Millbrae History Museum. The project includes a bioretention area.

Prioritized Project: Community Center Redevelopment

Image Source: Google Maps imagery (2018)

Site Information:

Location	623 Magnolia Ave, Millbrae, CA 94030
Capture Area	To be determined.
Impervious Area (%)	100%
Possible GI Measures	To be determined.

Project Schedule:

The project schedule is still to be determined.

Project Cost:

Community Center Rebuild Fund: $4,450,583

Project Description:

In February of 2019, Council adopted a Master Plan and scope of design services to focus on the rebuild of the Community Center. The recommended budget is associated with short term tasks only. Budgets will be adopted for each phase as funding is identified. This project will likely be C.3 regulated.

Prioritized Project: Moxy Intermodal Station (Private Project)

Image Source: Millbrae Station, Wikipedia

Site Information:

Location	100 California Dr, Millbrae, CA 94030
Capture Area	___ square feet
Impervious Area (%)	100%
Possible GI Measures	TBD

Project Schedule:

Design of the project started FY 2018, with project completion by end of calendar year 2019.

Project Cost:

Total:	$1,100,000
General Fund:	$750,000 (FY18=$350k, FY19=$400k)
Other Sources:	$350,000

Project Description:

Multimodal Comp Station Agency Access Plan

Will primarily be encumbered (and funded) in Fiscal Year 2018. Additional funds added as contingency.

Prioritized Project: Police Station

Image Source: Google Earth imagery (2018)

Site Information:

Location	581 Magnolia Ave, Millbrae, CA 94030
Capture Area	16,518 square feet
Impervious Area (%)	100%
Possible GI Measures	May have GI Potential

Project Schedule:

Design of the project started FY 2018, with project completion by end of calendar year 2021.

Project Cost:

General Fund: $1,400,000 (FY18=$500k, FY19=$350k, FY20=$350k, FY21=$200k[unfunded])

Project Description:

Initially City Hall Campus Program Project

Removed at mid-year as staff recommended redirecting focus from the City Hall redesign to a focus on ADA programs while considering future planning as well as to fund the replacement of the roof at the police station. Due to funding constraints, staff recommends an annual allocation to meet immediate needs pending development of a Facilities Master Plan.

There are plans to add green infrastructure to the neighboring Police station.